

SMITH FS/SPS Series

3A6989A

EN

For removal of materials from flat horizontal concrete and asphalt surfaces. For professional use only.

FS Series - Forward Cut

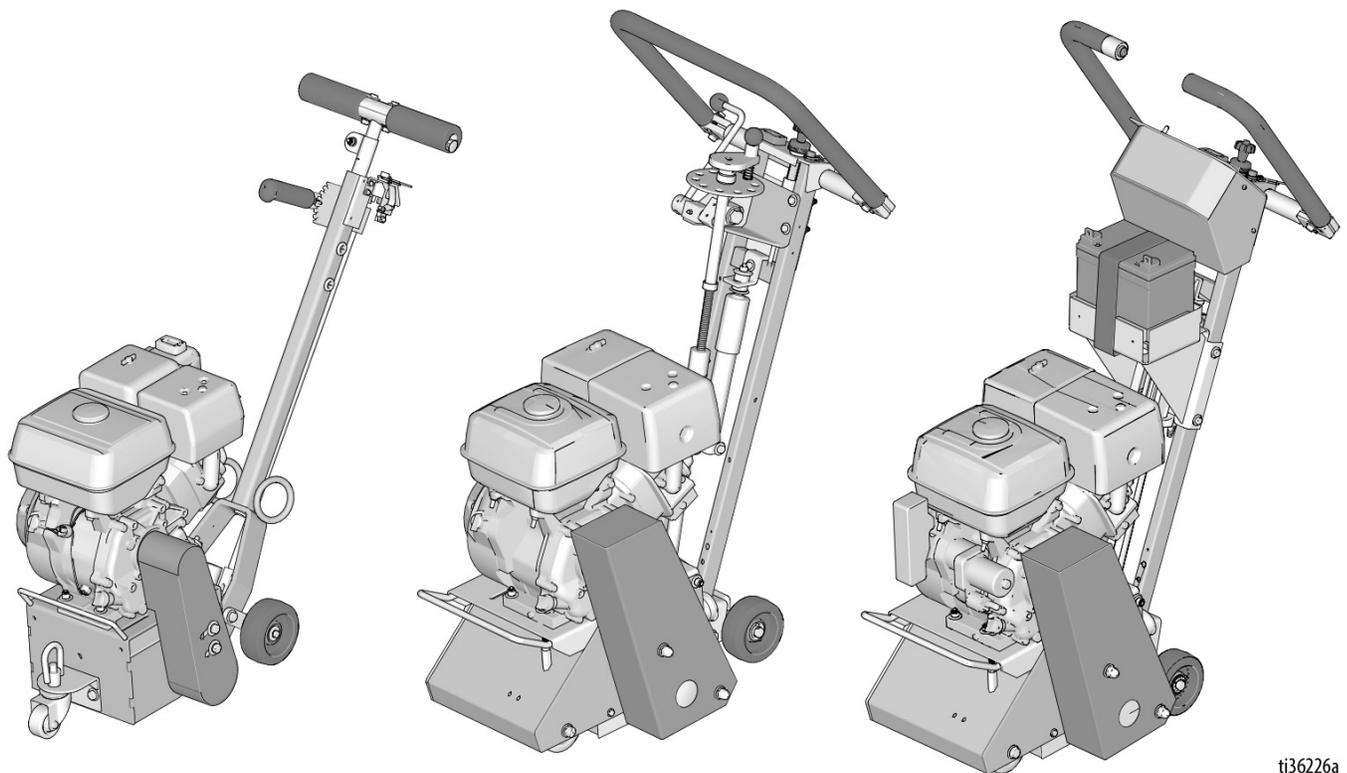
Model FS200 (160 cc / 5.5hp)

Model FS209 (270 cc / 9hp)

SPS Series - Forward Cut

Model SPS10 (390 cc / 13hp)

Model SPS10 DCS (390 cc / 13hp Electric Start)



FS200 / FS209

SPS10

SPS10 DCS

ti36226a

(Drums and cutters sold separately)

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Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbols refer to procedure-specific risks. When these symbols appear in the body of this manual or on warning labels, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.

 <h2 style="margin: 0;">WARNING</h2>	
 	<p>DUST AND DEBRIS HAZARD</p> <p>Grinding concrete and other surfaces with this equipment can create dust that contains hazardous substances. Grinding can also create flying debris.</p> <p>To reduce the risk of serious injury:</p> <ul style="list-style-type: none"> • Control the dust to meet all applicable workplace regulations. • Wear protective eye wear and a properly fit-tested and government approved respirator suitable for the dust conditions. • Use equipment only in a well-ventilated area. • Grinding equipment must be used only by trained personnel who understand the applicable workplace regulations.
 	<p>ENTANGLEMENT AND ROTATING PARTS HAZARD</p> <p>Rotating parts can cut or amputate fingers and other body parts.</p> <ul style="list-style-type: none"> • Keep clear of rotating parts. • Do not operate equipment with protective guards or covers removed. • Do not wear loose clothing, jewelry or long hair while operating equipment. • Before checking, moving, or servicing equipment, disable power supply.
	<p>BURN HAZARD</p> <p>Cutters and engine can become very hot during operation. To avoid severe burns, do not touch hot equipment. Wait until equipment has cooled completely.</p>
	<p>EQUIPMENT MISUSE HAZARD</p> <p>Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> • Do not operate the unit when fatigued or under the influence of drugs or alcohol. • Do not leave the work area while equipment is energized. Turn off all equipment when equipment is not in use. • Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only. • Do not alter or modify equipment. • Use equipment only for its intended purpose. Call your distributor for information. • Keep children and animals away from work area. • Comply with all applicable safety regulations. • Maintain a safe operating distance from other people in the work area. • Avoid any pipes, columns, openings, or any other objects protruding from work surface.
 	<p>PERSONAL PROTECTIVE EQUIPMENT</p> <p>You must wear appropriate protective equipment when operating, servicing, or when in the operating area of the equipment to help protect you from serious injury, including eye injury, inhalation of dust or chemicals, burns, and hearing loss. This equipment includes but is not limited to:</p> <ul style="list-style-type: none"> • Protective eye wear. • Protective shoes. • Gloves. • Hearing protection. • Properly fit-tested and government approved respirator suitable for the dust conditions.



WARNING



FIRE AND EXPLOSION HAZARD

Flammable fumes, such as solvent and paint fumes, in **work area** can ignite or explode. To help prevent fire and explosion:

- Use equipment only in well ventilated area.
- Do not fill fuel tank while engine is running or hot; shut off engine and let it cool. Fuel is flammable and can ignite or explode if spilled on hot surface.
- Keep work area free of debris, including solvent, rags and gasoline.
- Keep a fire extinguisher in work area.



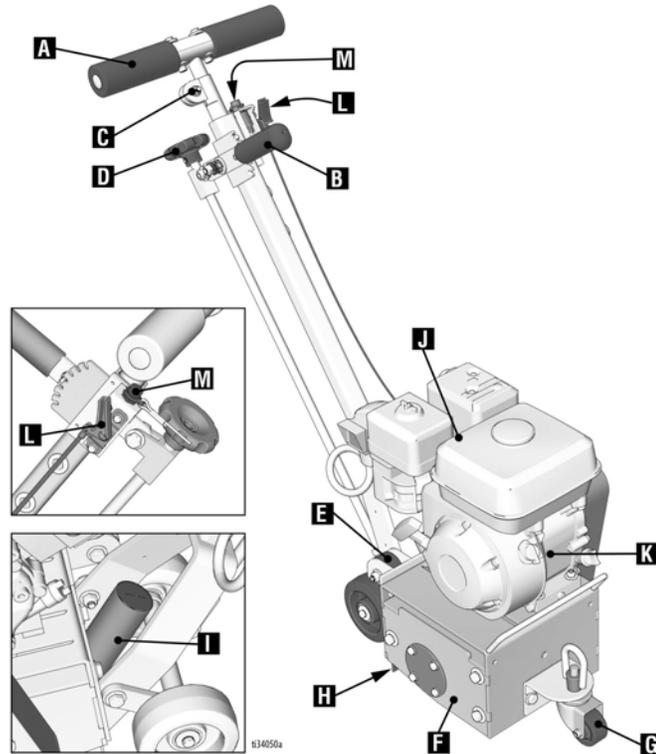
CARBON MONOXIDE HAZARD

Exhaust contains poisonous carbon monoxide, which is colorless and odorless. Breathing carbon monoxide can cause death.

- Do not operate in an enclosed area.

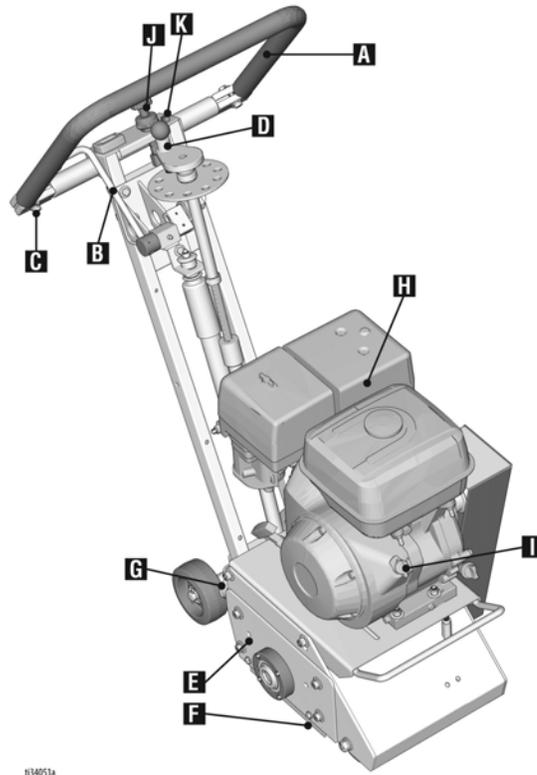
Component Identification

SMITH FS200 & FS209



	Component
A	Handlebar
B	Depth Engage Lever (coarse adjustment)
C	Locking Nut (for handle height adjustment)
D	Drum Adjustment Dial (fine adjustments)
E	Fixed Front Wheel (optional)
F	Drum Access Panel
G	Feathering Front Wheel
H	Dust Skirt
I	Vacuum Port
J	Engine
K	Engine Power Switch
L	Engine Throttle
M	Engine Kill Button

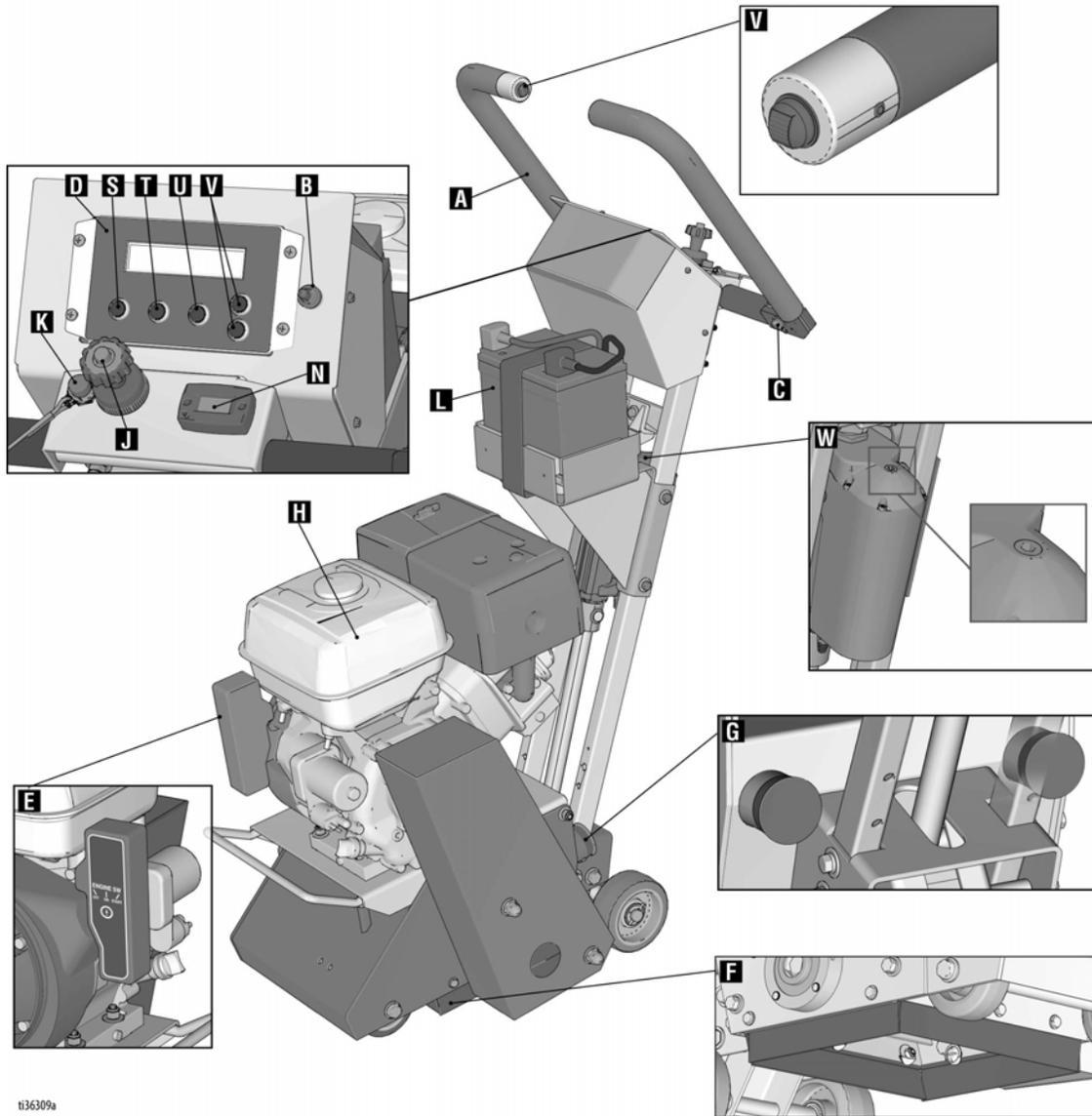
SMITH SPS10



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	Component
A	Handlebar
B	Drum Engage Lever
C	Handlebar Adjustment Bolts
D	Drum Adjustment Dial
E	Drum Access Panel
F	Dust Skirt
G	Vacuum Port
H	Engine
I	Engine Power Switch
J	Engine Throttle
K	Engine Kill Button

SMITH SPS10 DCS



t136309a

Component	
A	Handlebar
B	Power Switch
C	Handlebar Adjustment Bolts
D	DCS Control
E	Electric Start Engine Switch
F	Dust Skirt
G	Vacuum Port
H	Engine
J	Engine Throttle

Component	
K	Engine Kill Button
L	Battery
N	Hour Meter/Tachometer
S	Home Button
T	Zero Button
U	Cut Depth Button
V	Up/Down Buttons
W	Manual Height Adjustment

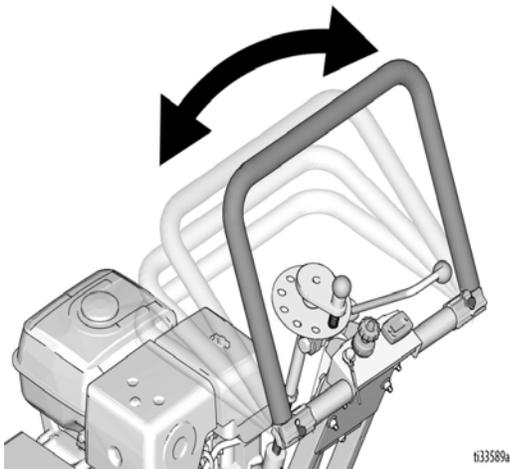
Setup

Handle Bar Adjustment (Models SPS10 & SPS10 DCS Only)

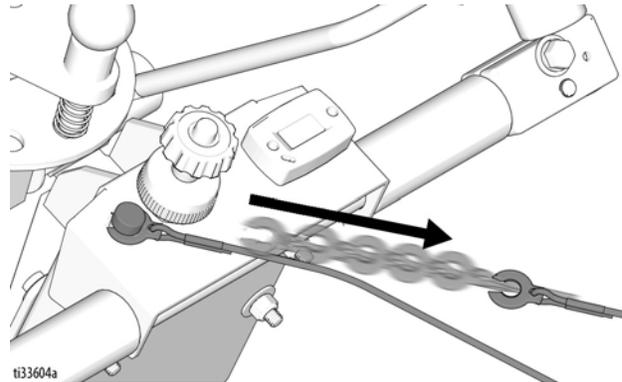
The handlebars are equipped with a high-density vibration suppression material to reduce operator fatigue when operating equipment. To adjust the handlebars to a new position for different height operators please follow these steps:

1. Using a 9/16" (14mm) wrench or socket, loosen the bolts on both sides of the handlebars until the handlebar moves freely.
2. Stand behind the machine and lightly tap the handlebar to the desired position.
3. Re-tighten the bolts to 260-300 in-lb (29-34 N·m) to lock the handlebars into position.

NOTE: Never operate equipment with loose handlebars. The bolts must be fastened tightly assuring the handle is locked into position.



stopped by pressing down on the Engine Kill Button.



Drum Installation/Replacement for SMITH FS Series Models

Normal use will require periodic drum inspection and may necessitate drum replacement. Time of replacement will vary according to usage and load factors.

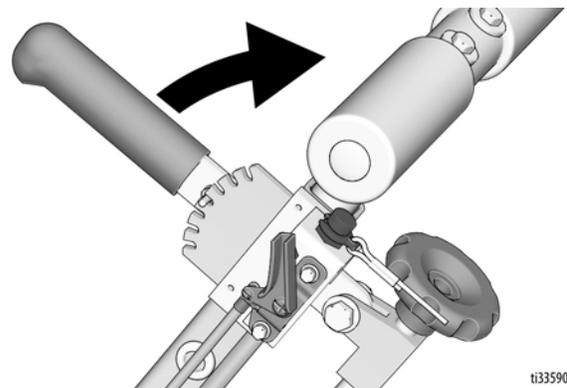
Tools needed:

1. 17mm socket or wrench
2. Rubber mallet



To avoid injury from unexpected start up, disconnect spark plug wire before you service your unit.

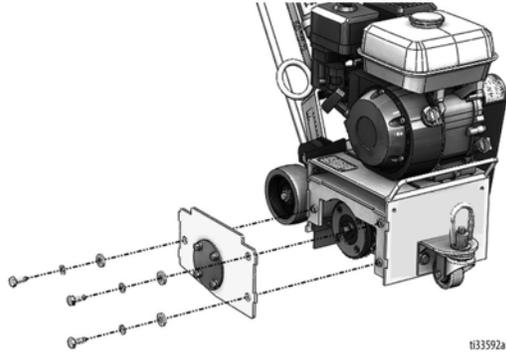
1. Raise the Drum Engage Lever to the up position so the cutter drum is off the ground.



Engine Kill Button

In the event of a malfunction or an accident (such as the machine operator falling or losing footing), the SMITH is equipped with a corded Engine Kill Button. Attach the end of the cord to the operator's belt or wrist, and snap the clip into place on the button by raising the top of the Engine Kill Button and inserting the clip into the gap. If the operator becomes distanced too far from the machine, the cord will detach from the button and the machine will stop running. The engine can also be

2. Remove the three hex head cap screws from the Drum Access Panel using the 17mm socket or wrench.
3. Remove Drum Access Panel (this may require the rubber mallet to break it loose).
4. Slide out drum assembly (use caution as it is heavy).



5. Once the cutter drum is removed, take to a workbench for assembly.
 - a. Inspect condition of cutters, spacers, shafts, bushings and drum.
6. Before replacing the drum onto hex shaft:
 - a. Check that all bearings are in good working order.
 - b. Remove dirt and material build-up from inside drive carriage and drum.
 - c. Lube all metal contacts.
7. Align and slide drum back onto the hex shaft.
8. Replace Drum Access Panel (lift up and lock into place) over hex shaft and secure hardware.

NOTE: An extra drum loaded with cutters for rapid job site replacement is recommended.

Drum Installation/Replacement for All SMITH SPS Series Models

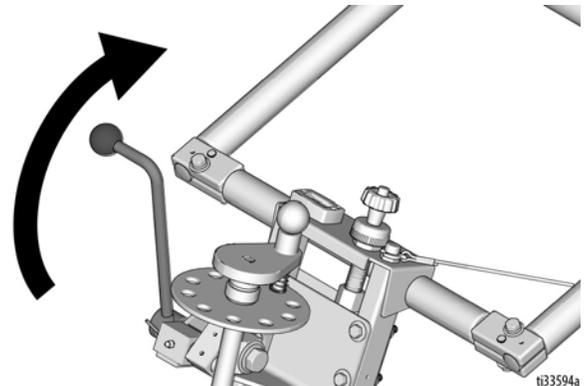
Normal use will require periodic drum inspection and may necessitate drum replacement. Time of replacement will vary according to usage and load factors. Tools needed:

1. 9/16" socket or wrench.
2. Rubber mallet.



To avoid injury from unexpected start up, disconnect spark plug wire before you service your unit.

1. **Non-DCS Models:** Raise the Drum Engage Lever to the up position so the cutter drum is off the ground.

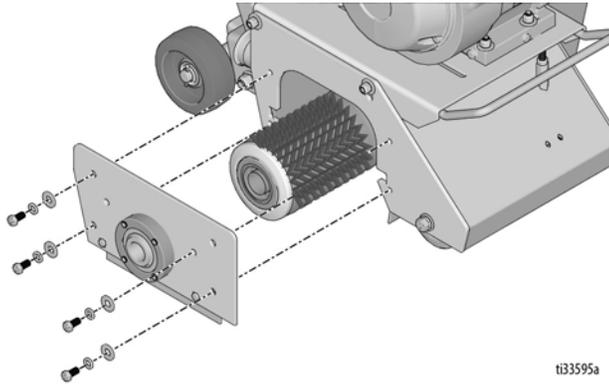


DCS Models: Press Home Button on DCS Control to raise the cutter drum off of the ground.

2. Remove the four hex head cap screws from the Drum Access Panel using the 9/16" socket or wrench.
3. Remove the Drum Access Panel (this may require the rubber mallet to break it loose).

Setup

- Slide out drum assembly (use caution as it is heavy).

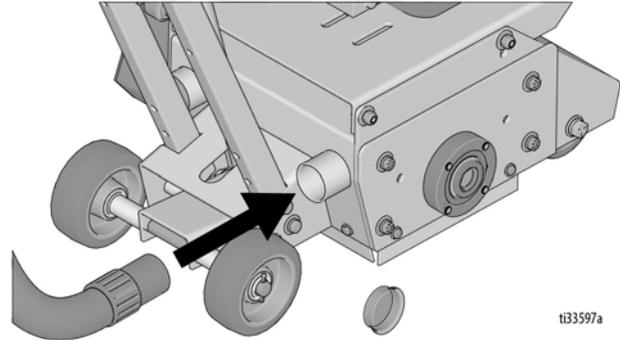


- Once the cutter drum is removed take to a workbench for assembly.
 - Inspect condition of cutters, spacers, shafts, bushings and drum.
- Before replacing the drum onto hex shaft:
 - Check that all bearings are in good working order.
 - Remove dirt and material build-up from inside drive carriage and drum.
 - Lube all metal contacts.
- Align and slide drum back onto the hex shaft.
- Replace Drum Access Panel (lift up and lock into place) over hex shaft and secure hardware.

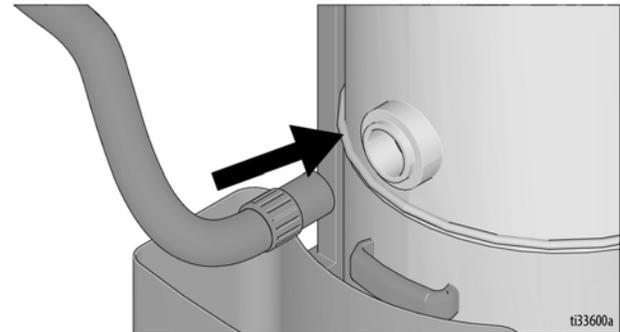
NOTE: An extra drum loaded with cutters for rapid job site replacement is recommended.

Vacuum Attachment

- If using a vacuum, attach vacuum hose to the Vacuum Port.



- Attach vacuum hose to the Inlet Port on the Cyclone Separator (optional) or vacuum.

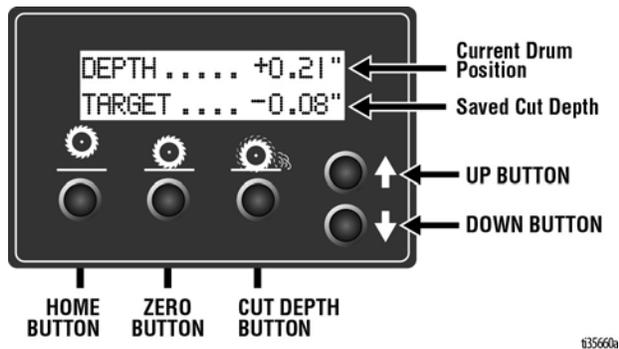


DCS Control (DCS Models only)

Buttons on the DCS Control have two functions, quick press and long press. Quick press refers to pressing the button and releasing the button quickly, while long press is pressing the button and holding the button for two or more seconds.

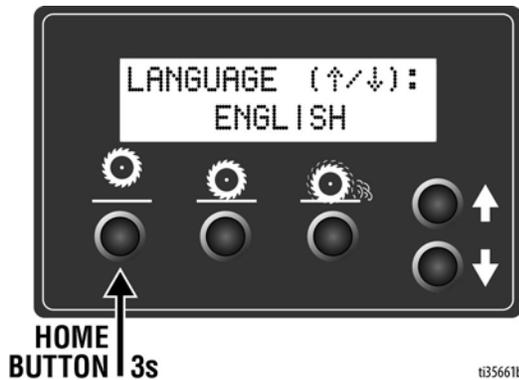
NOTE: "+" (plus) refers to above pavement surface. "-" (minus) refers to below pavement surface.

Run Screen

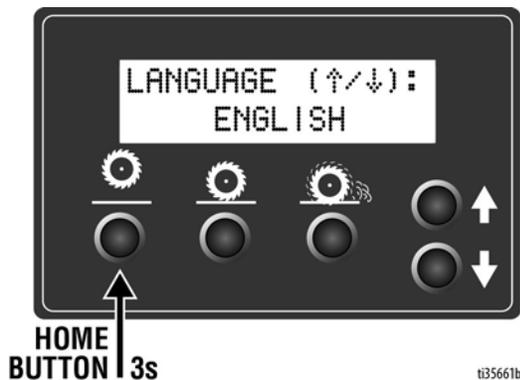


Home Button

Quick Press: Takes the drum to its highest position.

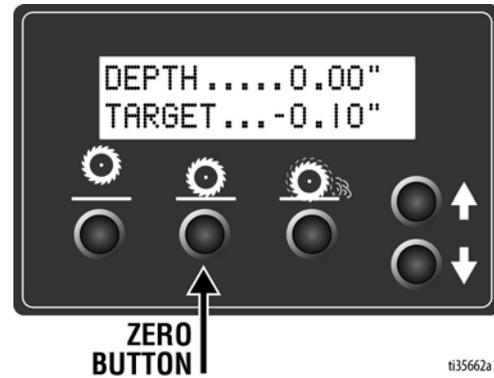


Long Press: Brings up Menu Screen.

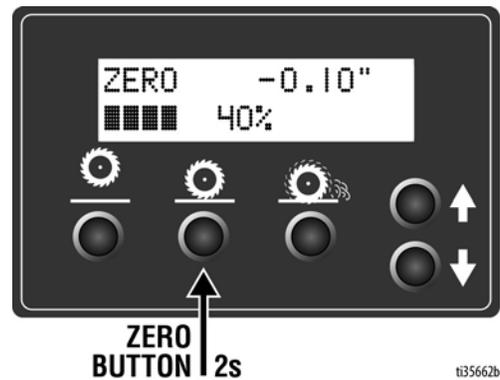


Zero Button

Quick Press: Takes the drum to the surface.

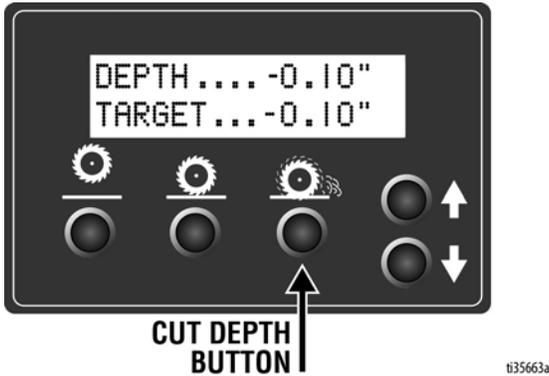


Long Press: Reprograms the zero point to the current drum position.



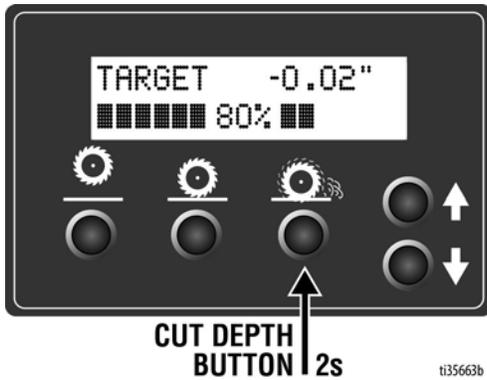
Cut Depth Button

Quick Press: Takes the drum to the Cut Depth Target.



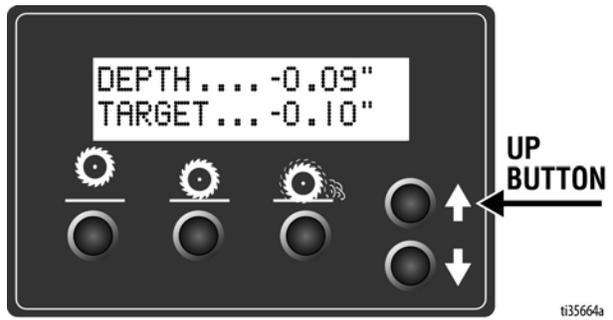
Long Press:

- If at or above zero point: Opens new screen to select desired cut depth using up/down buttons.
 - To exit without saving, quick press the Cut Depth Button.
 - To exit with saving, long press the Cut Depth Button.
- If below zero point: Reprograms the Cut Depth Target to the current drum position.

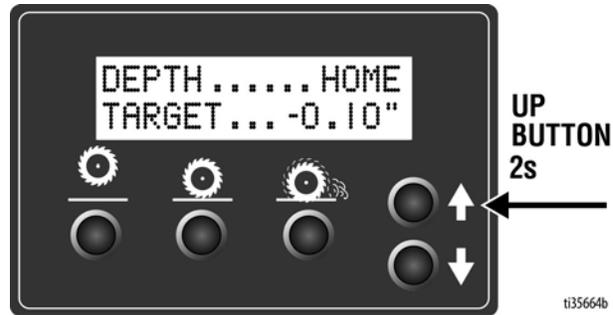


Up Arrow Button*

Quick Press: Raises the drum by 0.01" (0.25mm, 10 mil).

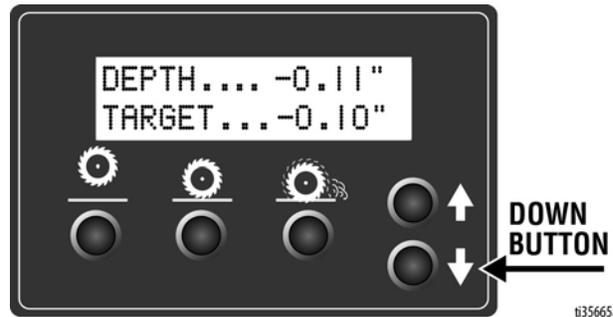


Long Press: Raises the drum to Home position.

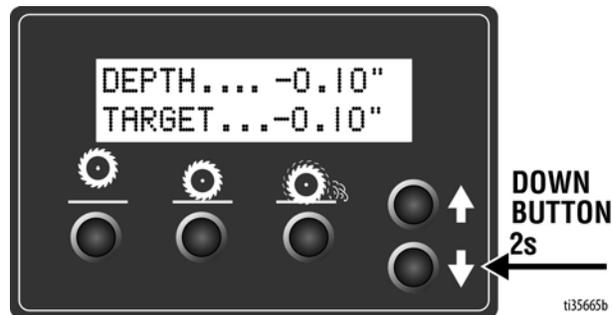


Down Arrow Button*

Quick Press: Lowers the drum by 0.01" (25mm, 10 mil).



Long Press: Lowers the drum to Cut Depth Target.



*Handlebar Rocker Switch has the same functions as Up and Down Arrow Buttons.

Menu Screens

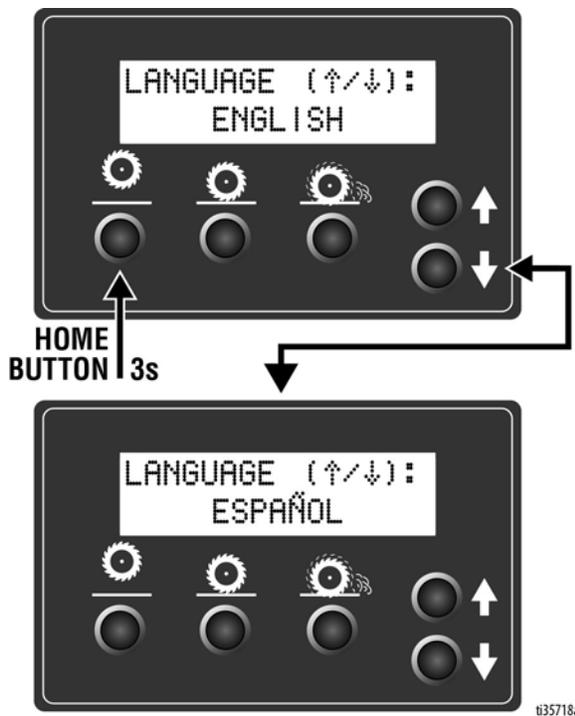
To display the Menu Screens, hold down Home Button from the Run Screen. To save menu settings and return to Run Screen, hold down Home Button from any Menu Screen.

To cycle through selections in each Menu Screen, use Up and Down Arrow Buttons.

To advance to next Menu Screen, quick press the Home Button.

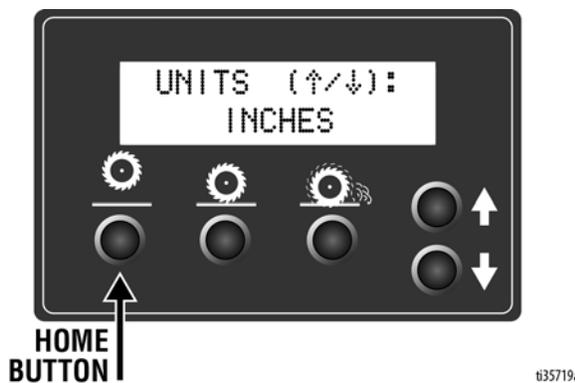
Menu Screen #1 - Language

Select your desired language (English, Spanish, French, German, or International Symbols).



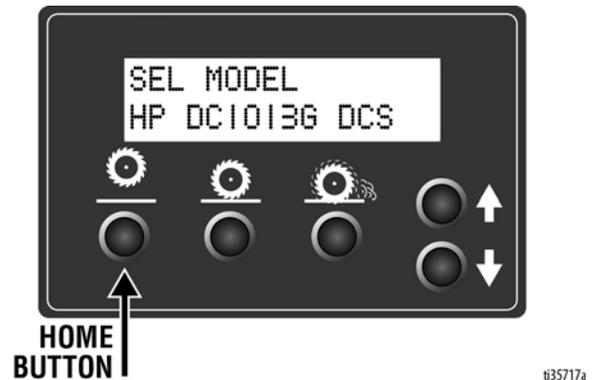
Menu Screen #2 - Units

Select your desired depth units (inches, millimeters, or mils).



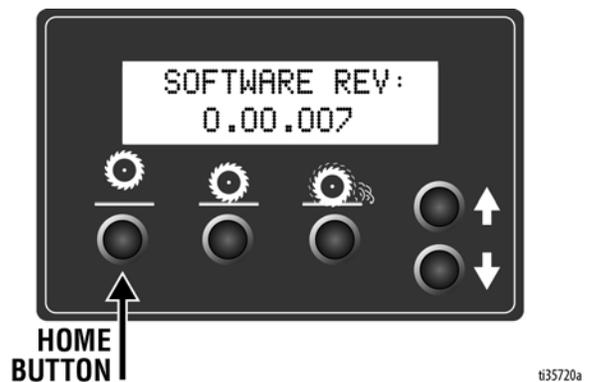
Menu Screen #3 - Model Select

Your SMITH model name can be found on the handle-bar dashboard label. Select the model on the DCS Control which matches the model you have. This ensures accurate depth readings. Hold down Up or Down Arrow Buttons to cycle through models.



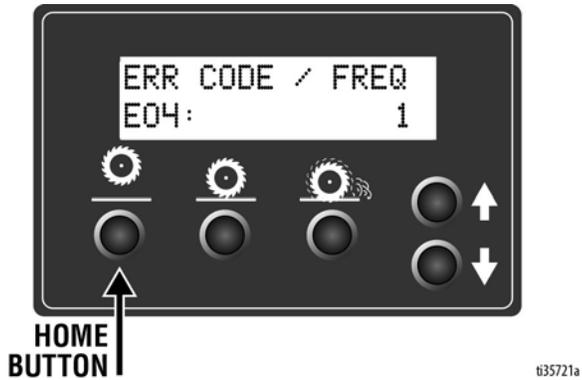
Menu Screen #4 - Software revision

Displays the revision of the software on the DCS Control.



Menu Screen #5 - Error Codes

Displays the most recent error code and the total number of times that error has occurred. Cycle through previous error codes using Up/Down Buttons.



Error Codes

- E04: High Voltage
- E05: High Motor Current
- E08: Low Voltage
- E09: Hall Sensor Error
- E12: High Current (short circuit)
- E31: Home Button Error
- E32: Zero Button Error
- E33: Cut Depth Button Error
- E34: Up Button Error
- E35: Down Button Error

To clear an error code that appears while on the Run Screen:

1. Turn DCS Power Switch OFF.
2. Address/Fix the issue.
3. Turn DCS Power Switch ON.

NOTE: See Repair Manual for more information on Error Codes and Troubleshooting.

Operation

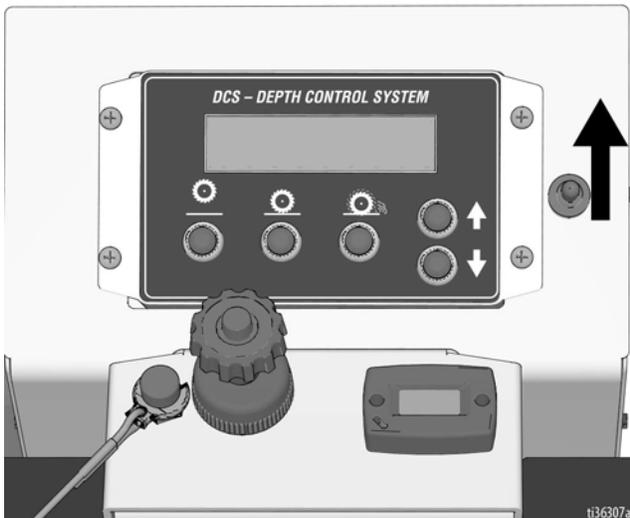


Do not start machine while drum is in contact with the ground. Doing so can cause the operator to lose control of the machine, resulting in property damage and/or personal injury.

Machine Start Up

DCS Models Only

Turn DCS Control Power Switch ON (Engine will not start if power switch is off). See **DCS Control (DCS Models only)**, page 11, for help setting up the DCS Control.



Before starting engine, perform the following:

All Models

- Read and understand engine manual.
- Make sure all guards are in place and secure.
- Make sure all mechanical fasteners are secure.
- Inspect for damage to engine and other exterior surfaces.

- Use correct cutters for each job. Make sure drum is balanced and the correct number, size and type of cutter wheels are being used. Make sure Drum Access Panel is locked and secured.
- Inspect work area to locate any pipes, columns, deck inserts, or other objects protruding from work surface. Avoid these objects during operation.
- Open the fuel shut off on the gas tank and then place the throttle lever at the “fast idle” position.
- Move the choke to closed.
- Set the engine power switch to **ON**.
- **Non-DCS Models:** Pull starter cord.
- **DCS Models:** Turn Engine Key to ignition.
- After the engine starts, move choke to open.
- Set throttle to desired setting.

If the Engine Does Not Start

- Check engine for proper gas level.
- Check the spark plug. Make sure socket areas are clean and clear of debris, and the proper gap is set. Replace if needed.
- Turn the Engine Power Switch on the front of the engine to “On”.
- Engine may have tilted backwards. If so, allow oil to drain after removing spark plug.
- If engine still does not start, refer to the engine manual.
- The engine will not start without the Corded Engine Kill Clip securely in place.

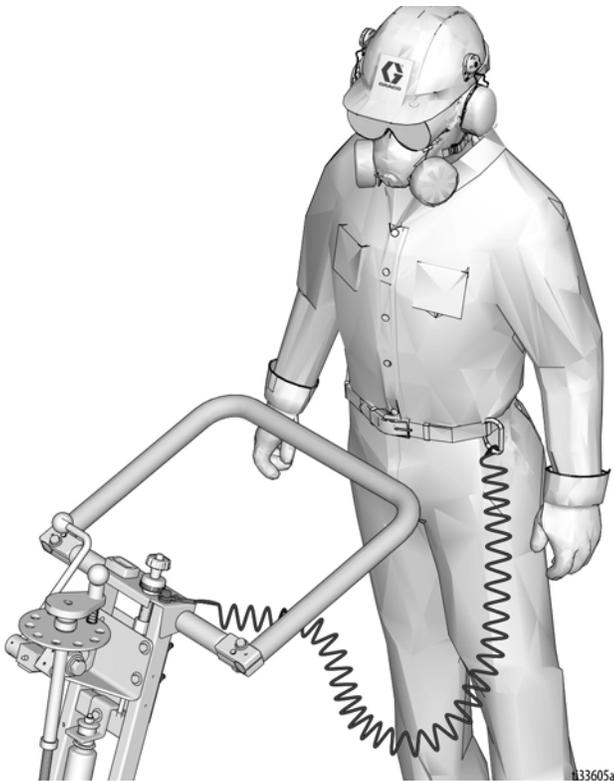
NOTE: The machine will still move with the engine off because there are no wheel brakes.

Cutting Material

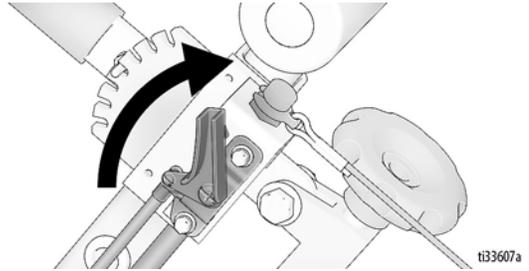
				
<p>Maintain a safe operating distance from other people in the work area. Avoid any pipes, columns, openings, or any other objects protruding from your work surface.</p>				

Before substrate removal, test run the drum with cutters not touching the surface. If there is excessive vibration, you need to re-balance the cutter set-up, check bearing condition, and/or make sure that the Drum Access Panel is secured.

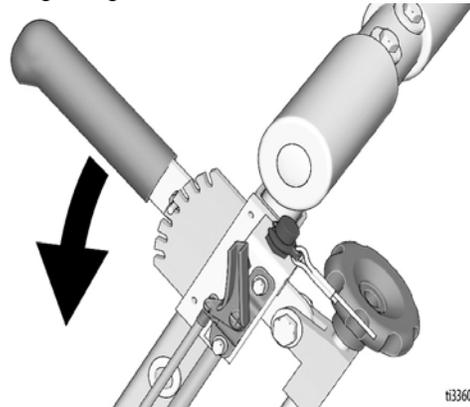
1. **Start Engine**, see page 15.
2. Turn vacuum on, if using a vacuum.
3. Connect Engine Kill Button Cord to operator.



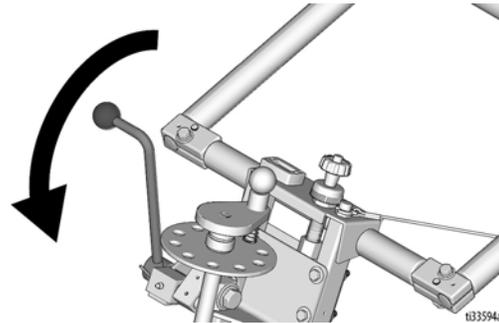
4. Slide Engine Throttle to desired setting.



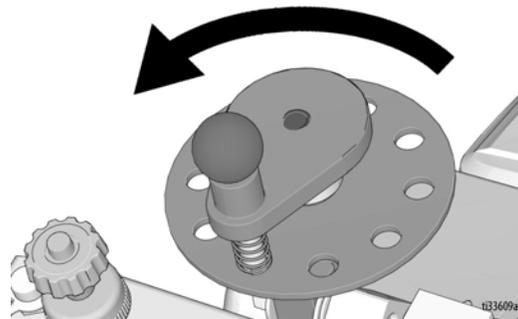
5. **FS Series Models-** Disengage Drum Engage Lever and adjust to position where drum is almost touching the ground.



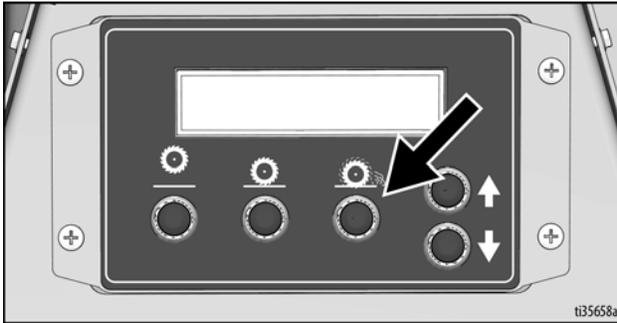
SPS Series Models (Non-DCS Models Only): Lower the Drum Engage Lever into the down position.



6. **Non-DCS Models:** Rotate Drum Adjustment Dial until drum comes into contact with surface and desired depth is reached.



DCS Models: On the DCS Control, press the Cut Depth Button to lower the drum to the programmed cut depth. See **DCS Instructions**, page 19, for more details.



NOTE: Several test cuts may be needed to dial in desired cutting depth.

NOTICE

Should you desire to tilt the machine, always tilt forward. Tilting the machine backwards at any time will flood the spark plug with oil and may cause damage to your engine.

NOTE: On harder surfaces, it may be best to make several passes in increments of 1/32 in. (0.8 mm) to get to the desired depth.

- Make certain that the drum is positioned to where only the cutter tips strike the surface, and that the drum assembly never comes into contact with the substrate. The cutter tips alone should strike the surface.
- The drum will not withstand substrate contact. Contacting the removal surface too deeply will cause premature wear to cutters, shafts, drum and other components. The correct depth setting is indicated by relatively little machine vibration.
- Cutting too deep only has negative results. Try to remove materials in several passes rather than one, deep pass. Several tests will show the best, most appropriate cutter impact. Use a forward, backward and/or circular pattern to achieve your desired finish.

NOTE: Positioning the machine over the surface in many directions, as well as dialing the hand wheel up or down can help create desirable surface patterns. After several hours of practice, the operator will become comfortable and should be able to remove materials faster with enhanced results.

NOTE: The engine should not labor. Run engine at full speed and adjust forward speed to fit the work being performed. Harder concrete surfaces will have to be cut at a slower pace than asphalt or other softer surfaces.

Cutting Drum Assemblies

BURN HAZARD
Avoid touching or handling drum after use until it has completely cooled.

Different drum configurations can be used for different applications. Visit www.SMITH.com/drumassembly for instructions on how to assemble various drum configurations.

Carbide Flail Cutter Assembly

Gradually adjust depth down to remove marking line (minimal amount of paved surface should be removed).

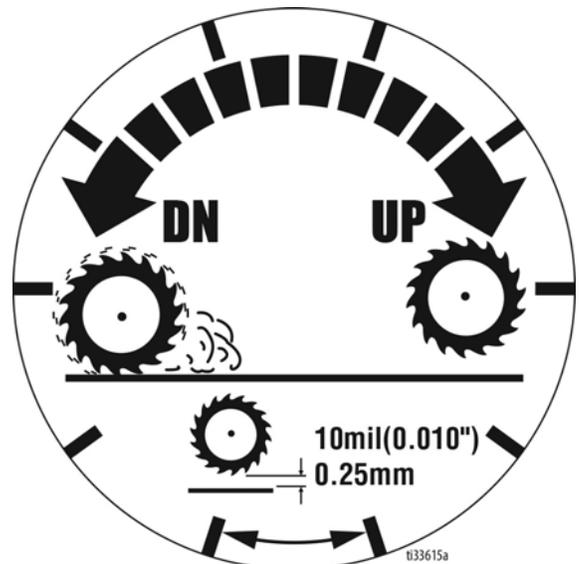
Carbide Miller Cutter Assembly

Best results for deep cuts are achieved by making several thin passes. A single pass should be no deeper than 1/32 in. (0.8 mm) or damage to rods and cutters could occur.

Diamond Blade Assembly (SMITH SPS Series Models only)

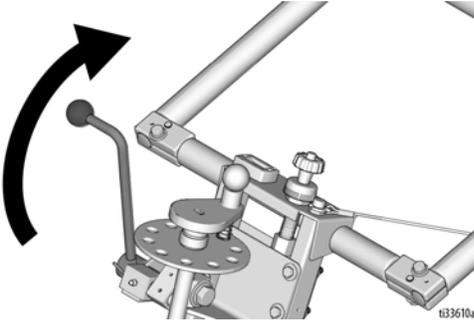
Diamond Blades are designed to be cooled by airflow around the blades. Lift blade out of cut every 10 to 15 seconds, then run at full speed for several seconds to prevent excessive heat build up that could damage the blades.

SPS Series Only (Non-DCS Models): Each increment on Drum Adjustment Dial (D) is 0.010 in. (0.25 mm) depth change of cutting drum.



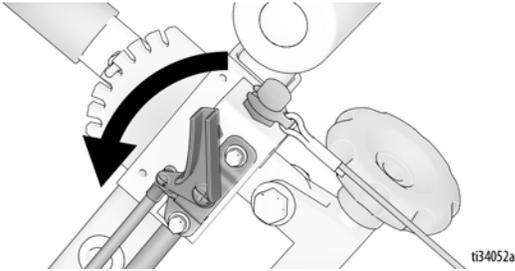
Stop Cutting Material

1. **Non-DCS Models:** Raise Drum Engage Lever so that the drum is off of the ground.

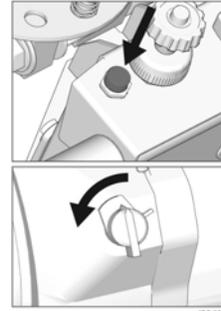


DCS Models: On DCS Control, press the Home Button to raise the drum off of the ground.

2. Slide Engine Throttle to low setting.



3. Depress Engine Kill Button and turn Engine Power Switch to "OFF".

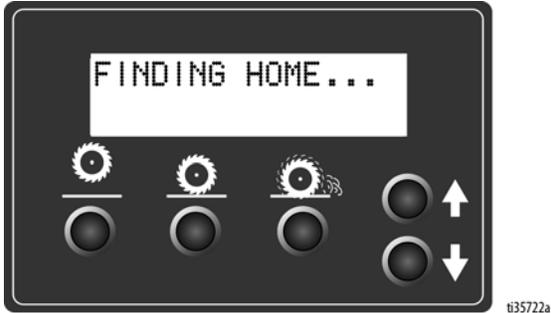


DCS Models: Turn DCS Control Power Switch to OFF.

4. Clean the entire exterior of the machine after it has cooled. Check for worn or damaged parts and perform any required **Maintenance** on page 21.

DCS Instructions

Each time the DCS Control is turned on, the DCS actuator will travel to the Home position.

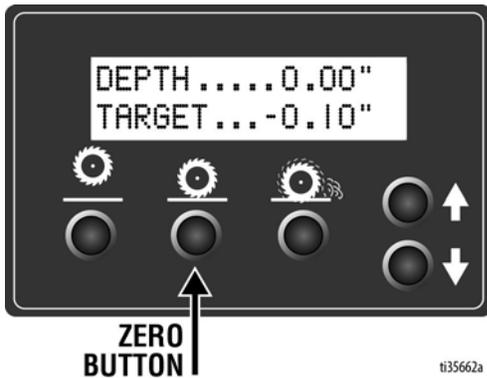


Once the DCS Control finds Home, ensure the correct model is selected as well as your desired language and units. See **Menu Screens**, page 13, for instructions on changing these settings.

Set Zero Point:

With the engine on, lower the drum by pressing the Down Arrow Button until you hear the cutters make contact with the pavement surface. Hold down the Zero Button for 2 seconds. Your Zero Point has now been saved.

NOTE: The Cut Depth Target is based off of the Zero Point. Re-program the Zero Point if the drum is changed or worn.



Set Cut Depth Target:

Quick press the Zero Button to take the drum to the pavement surface. Set the Cut Depth Target by:

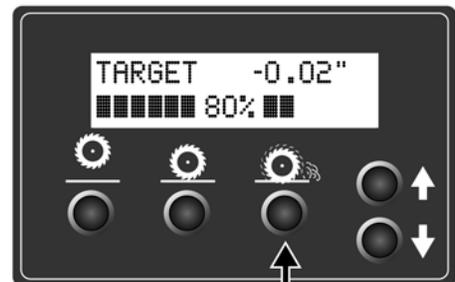
1. Quick pressing the Down Arrow Button as many times as needed to achieve your target. Then long press the Cut Depth Button to save your target.

NOTE: This method will lower the cutting drum into the pavement surface as you set your cut depth.

OR

2. From the Zero Point, long press the Cut Depth Button until a new screen pops up. Use the Down Arrow Button to enter your Cut Depth Target. Then long press the Cut Depth Button to save your target and return to the Run Screen.

NOTE: This method will keep the cutting drum stationary as you set your Cut Depth Target.



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The DCS Control is now ready to grind/scarify. Long press down on the Handlebar Rocker Switch to lower the drum to your Cut Depth Target. Short press up or down on the switch to adjust your Cut Depth on the fly. When finished with your cut, long press up on the switch to raise the drum to the Home position.

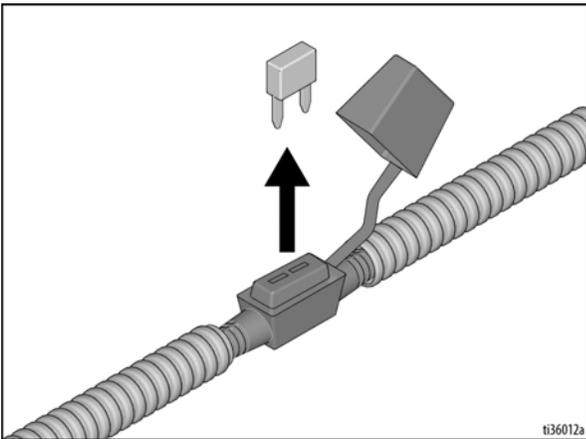
NOTE: The Zero Point and Cut Depth are referenced from the Home position. Recalibrate your DCS Control periodically by pressing the Home button or long pressing up on the Handlebar Rocker Switch.

NOTE: Pressing any button while the drum is moving to Zero or Cut Depth will stop the command and halt the drum from moving any further up or down until another button is pressed.

Manual Height Adjustment

If the DCS Control is not usable (dead battery, etc.), the drum height can be adjusted using the Manual Height Adjustment feature.

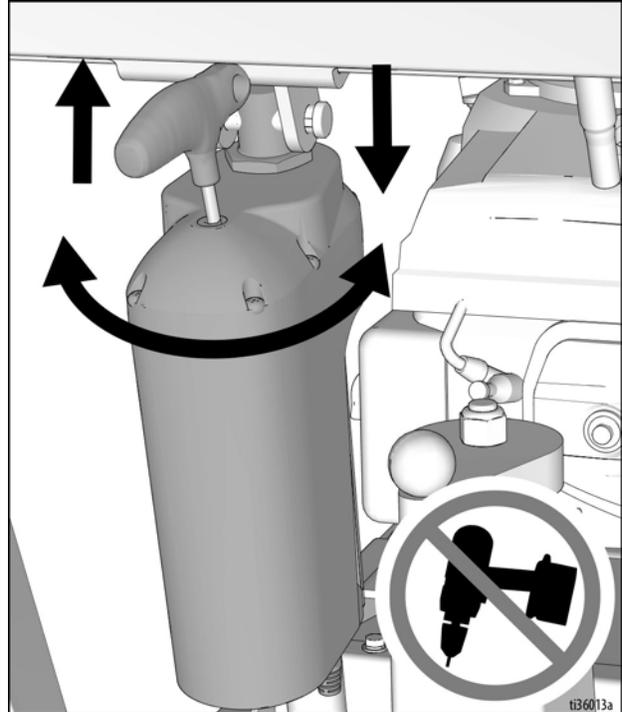
1. Remove fuse from fuse holder near positive battery terminal. This will protect the battery from damage.



2. Use a 6mm hex key to remove the screw plug on the top of the linear actuator.

3. Insert 6mm hex key into the port the screw plug was removed from.

- One revolution of the hex key results in 1/8" (3mm, 125 mil) of adjustment at the cutter drum.
- Rotate counterclockwise to lower the drum; rotate clockwise to raise the drum. **Max rotation speed of 1 revolution per second. Do not use power tools in the Manual Height Adjustment port.**



4. Once the desired depth is achieved, replace the screw plug in order to keep water and dust out.

Maintenance



Avoid touching engine and drum after use until they have completely cooled. To avoid unexpected start up, disconnect spark plug wire before you service your unit.

The following steps should be performed to maintain proper operation and sustain the life of the SMITH.

BEFORE OPERATION:

- Visually inspect the entire unit for damage or loose connections.
- Check engine oil (see engine manual).
- Check drum bushings and cutters.
- Check drum for uneven wear.

DAILY:

- Check all fasteners and re-tighten.
- Clean dust and debris from exterior of unit (do NOT use pressure washer or other high pressure cleaning equipment).
- Inspect dust skirts for damage. Repair or replace damaged skirts in order to help dust and debris containment.
- Check engine oil level and fill as necessary.
- Check and fill gas tank.
- Remove air filter cover and clean element. Replace element if necessary. Replacement elements can be purchased from your local engine dealer.

Pro Models:

- Grease the cam lever and lower linkage (non-DCS models only).

AFTER THE FIRST 20 HOURS OF OPERATION:

- Drain engine oil and refill with clean oil. See engine manual for correct viscosity.

EVERY 40-50 HOURS OF OPERATION:

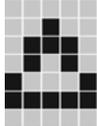
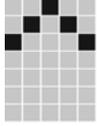
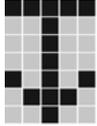
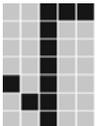
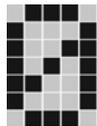
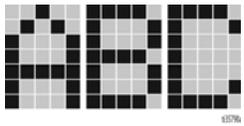
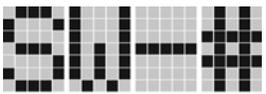
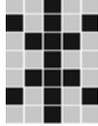
- Change engine oil (see engine manual).
- Grease wheel bearings.
- Inspect and change drum bushings and shafts.

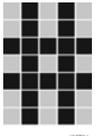
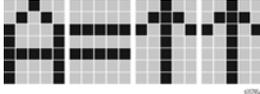
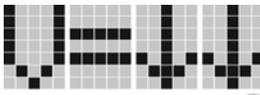
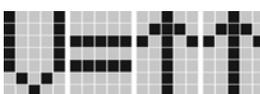
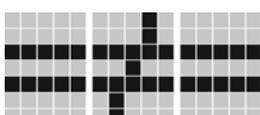
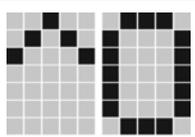
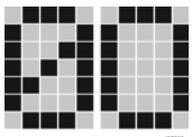
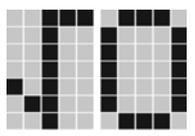
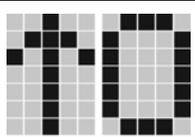
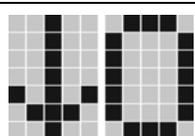
AS REQUIRED:

- Check drive belt and tension and tighten or replace as needed.

For additional information about engine maintenance, see engine manual.

DCS Control Translations

English	Español	Français	Deutsche	International
FINDING HOME	ENCONTRANDO INICIO	TROUVER LE DÉBUT	START FINDEN	 ©1978a
HOME	INICIO	DÉBUT	START	 ©1978a
DEPTH	ALTURA	HAUTEUR	TIEFE	 ©1978a
TARGET	OBJETIVO	OBJECTIF	ZIEL	 ©1978a
ZERO	CERO	ZÉRO	NULL	 ©1978a
SEL MODEL	MODELO	MODELE	MODELL	 ©1978a
LANGUAGE	IDIOMA	LA LANGUE	SPRACHE	 ©1978a
UNITS	UNIDAD DE MEDIDA	UNITÉ DE MESURE	MAßEINHEIT	 ©1978a
INCHES	PULGADAS	POUCES	ZOLL	INCH
MILLIMETERS	MILIMETROS	MILLIMETRES	MILLIMETER	MM
MILS	MILS	MILS	MILS	MIL
SOFTWARE REV	SOFTWARE REV	REVUE SOFTWARE	SOFTWARE REV	 ©1978a
ERROR	ERROR	ERREUR	FEHLER	 ©1978a

English	Español	Français	Deutsche	International
FREQUENCY	FRECUENCIA	FRÉQUENCE	ANZHAL	
HIGH CURRENT	ALTA CORRIENTE	COURANT ÉLEVÉ	HOHER STROM	
LOW VOLTAGE	BAJO VOLTAJE	BASSE TENSION	NIEDERSPANNUNG	
HIGH VOLTAGE	ALTO VOLTAJE	HAUTE TENSION	HOCHSPANNUNG	
HALL SENSORS	SENSORES DE HALL	CAPTEURS DE HALL	HALL-SENSOREN	
HOME BUTTON	BOTÓN DE INICIO	BOUTON DE DÉBUT	START KNOPF	
ZERO BUTTON	BOTÓN CERO	BOUTON ZÉRO	NULLTASTE	
CUT BUTTON	BOTÓN DE CORTAR	BOUTON DE COUPE	SCHNITT TASTE	
UP BUTTON	BOTÓN ARRIBA	BOUTON HAUT	NACH OBEN TASTE	
DOWN BUTTON	BOTÓN DE ABAJO	BOUTON BAS	NACH UNTEN TASTE	

Repair

Drum Replacement for SMITH FS Series Models

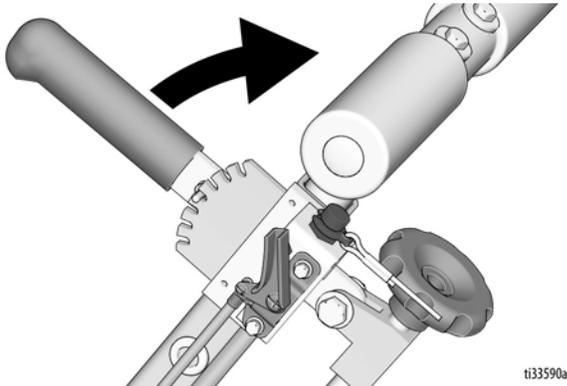
Normal use will require periodic drum inspection and may necessitate drum replacement. Time of replacement will vary according to usage and load factors.

Tools needed:

1. 17mm socket or wrench.
2. Rubber mallet.

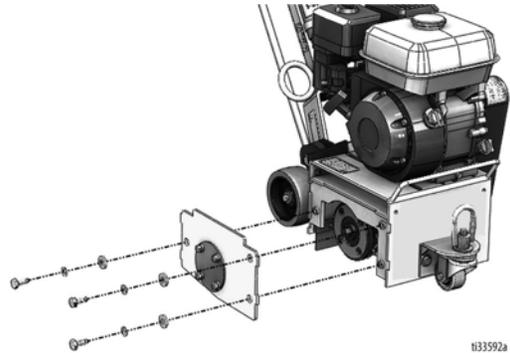
				
To avoid injury from unexpected start up, disconnect spark plug wire before you service your unit.				

1. Raise the Drum Engage Lever to the up position so the cutter drum is off the ground.



2. Remove the three hex head cap screws from the Drum Access Panel using the 17mm socket or wrench.
3. Remove Drum Access Panel (this may require the rubber mallet to break it loose).

4. Slide out drum assembly (use caution as it is heavy).



5. Once the cutter drum is removed, take to a workbench for assembly.
 - a. Inspect condition of cutters, spacers, shafts, bushings and drum.
6. Before replacing the drum onto hex shaft:
 - a. Check that all bearings are in good working order.
 - b. Remove dirt and material build-up from inside drive carriage and drum.
 - c. Lube all metal contacts.
7. Align and slide drum back onto the hex shaft.
8. Replace Drum Access Panel (lift up and lock into place) over hex shaft and secure hardware.

NOTE: An extra drum loaded with cutters for rapid job site replacement is recommended.

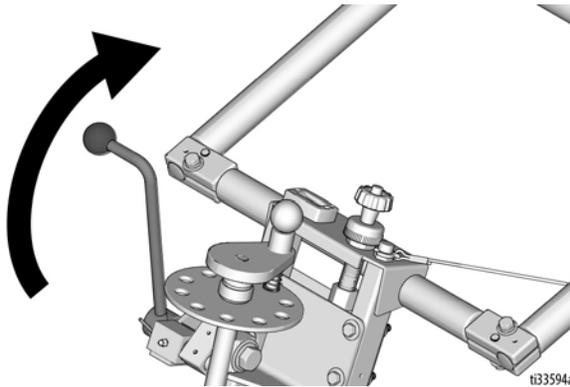
Drum Replacement for All SMITH SPS Series Models

Normal use will require periodic drum inspection and may necessitate drum replacement. Time of replacement will vary according to usage and load factors. Tools needed:

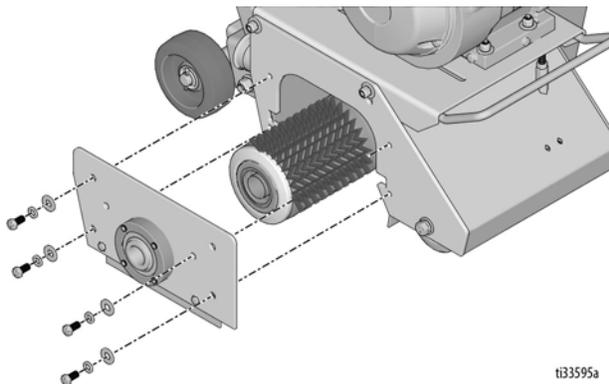
1. 9/16" socket or wrench.
2. Rubber mallet.



1. Raise the Drum Engage Lever to the up position so the cutter drum is off the ground.



2. Remove the four hex head cap screws from the Drum Access Panel using the 9/16" socket or wrench.
3. Remove the Drum Access Panel (this may require the rubber mallet to break it loose).
4. Slide out drum assembly (use caution as it is heavy).



5. Once the cutter drum is removed take to a workbench for assembly.
 - a. Inspect condition of cutters, spacers, shafts, bushings and drum.
6. Before replacing the drum onto hex shaft:
 - a. Check that all bearings are in good working order.
 - b. Remove dirt and material build-up from inside drive carriage and drum.

- c. Lube all metal contacts.

7. Align and slide drum back onto the hex shaft.
8. Replace Drum Access Panel (lift up and lock into place) over hex shaft and secure hardware.

NOTE: An extra drum loaded with cutters for rapid job site replacement is recommended.

Belt Replacement (FS Series Models)

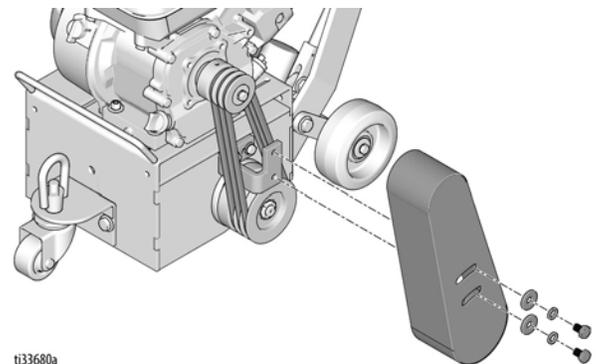
Normal wear may necessitate belt tensioning or replacement. Time of replacement will vary according to usage and belt load factors.

Replacement is easy and requires a few hand tools.

1. 17mm wrenches.
2. 1/2" socket or wrench.
3. 13mm socket or wrench.
4. Rubber mallet.

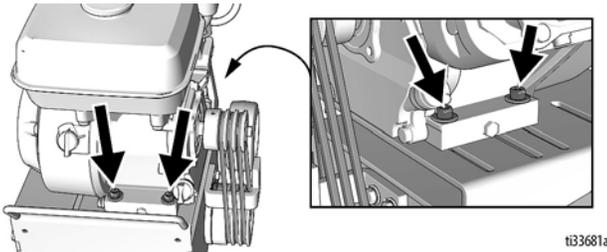


1. Make sure the Drum Access Panel is installed. This ensures the drive ends are in the proper position for servicing.
2. Clean the machine exterior so you can locate all the appropriate parts.
3. Using a 17mm socket or wrench, remove the two hex bolts attaching the belt cover to the side of the machine. Remove the cover and set it aside.



Repair

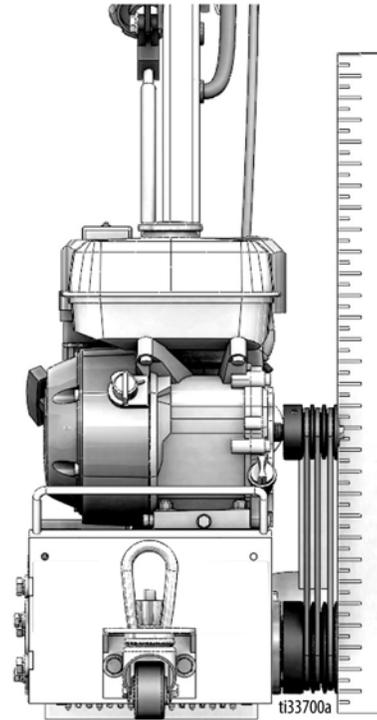
- Using the 1/2" socket or wrench, loosen (do not remove) the four nylock nuts locking down the engine until the engine slides freely.



- Slide the engine back enough to remove and replace the belts as necessary.
- Roll the new belt on one groove at a time on both the top and bottom pulleys.
- Using the straight edge, lay it across the lower pulley outer face and against the upper pulley. They must be directly over top of each other to ensure long belt life. If adjustment is required, align before tensioning the belt.

NOTE: It may be necessary to remove the belt guard support bracket in order to get the straight edge flush on the pulleys. Do this using a 13mm socket or wrench.

- Verify pulleys are properly aligned, tighten everything down and re-check pulley alignment one last time.



Belt Replacement (All SPS Series Models)

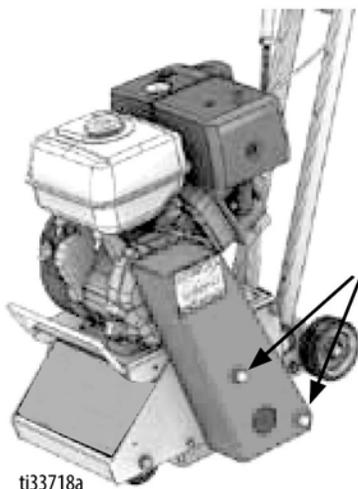
Normal wear may necessitate belt tensioning or replacement. Time of replacement will vary according to usage and belt load factors.

Replacement is easy and requires a few hand tools.

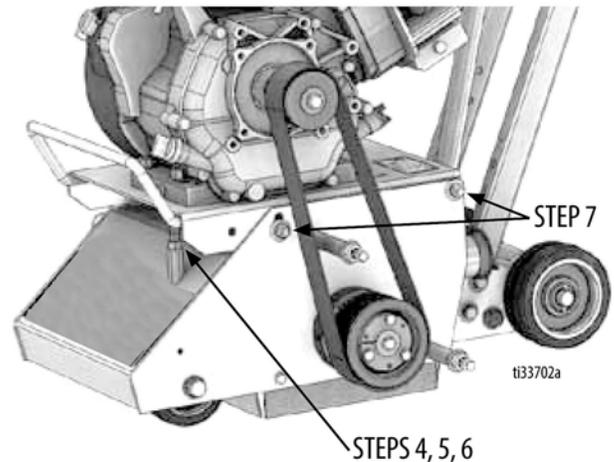
1. Two 9/16" wrenches.
2. 3/4" wrench.
3. 3/8" open-end wrench.
4. Carpenters square or straight edge.
5. Spray lubricant.
6. Spark plug wrench.



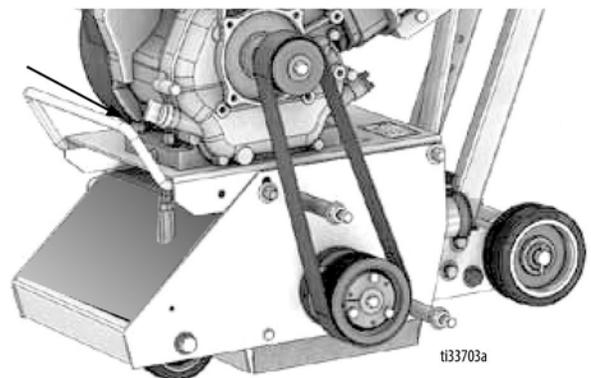
1. Make sure the Drum Access Panel is installed. This ensures the drive ends are in the proper position for servicing.
2. Clean the machine exteriors so you can locate all the appropriate parts.
3. Using a 3/4" wrench, remove the two acorn nuts attaching the belt cover to the side of the machine. Remove the cover and set it aside.



4. Lubricate the motor plate (belt tensioning) jackscrew with spray lubricant on the front of the machine.
5. Use a 9/16" wrench to loosen the jackscrew retaining nut.
6. Using the 3/8" open-end wrench, begin to screw the motor plate jackscrew back into the long hex nut below it. Screw it all the way until resistance is felt.

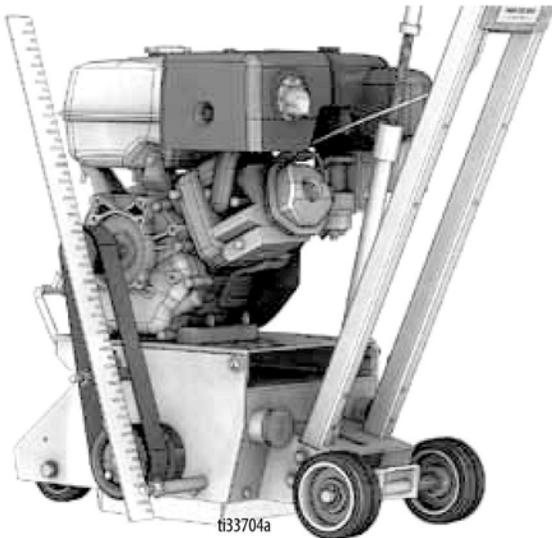


7. Loosen (do not remove) the four bolts (2 per side) that secure the motor mount plate to the main machine frame.
8. Loosen the four bolts attaching the motor to the motor plate. After sufficiently loosening all four, slide the motor back all the way to the rear. This will loosen the belt sufficiently to remove it.

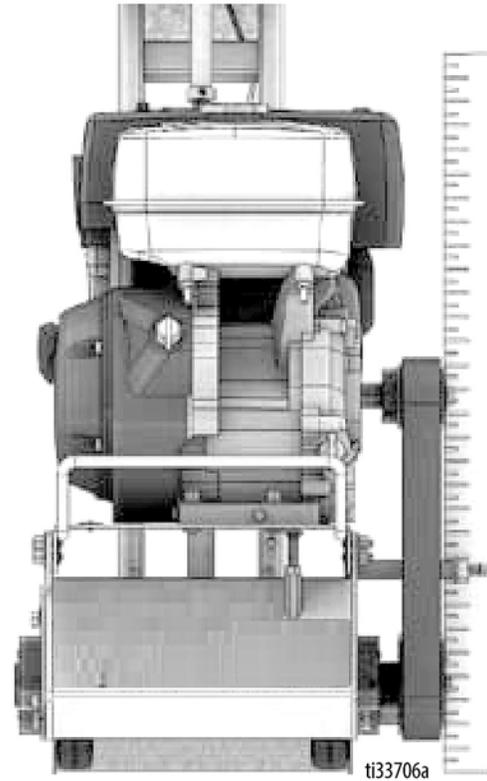


9. Either cut or roll off the belt from the pulleys. If you roll it off, move it over one groove at a time on the upper and lower pulleys to completely remove it.
10. Roll the new belt on one groove at a time on both the top and bottom pulleys.

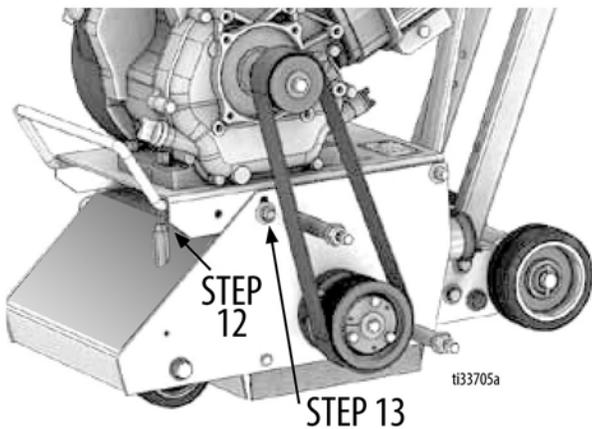
- Using the straight edge, lay it across the lower pulley outer face and against the upper pulley. They must be directly over top of each other to ensure long belt life. If adjustment is required, align before tensioning the belt. Tighten the four bolts that secure the motor mount plate to the frame.



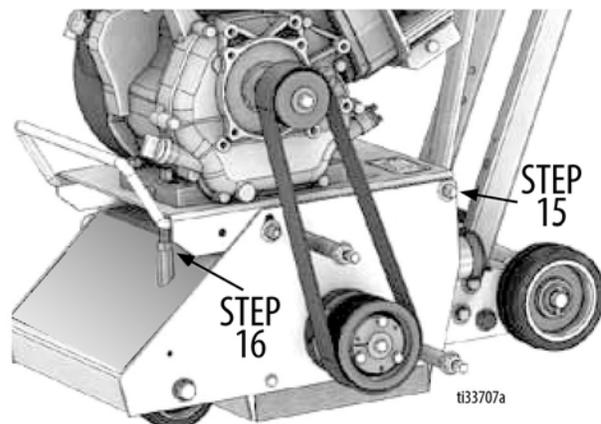
- From the front of the machine, observe the motor plate to machine alignment. Tightening the belts with the jackscrew tends to cause the right side of the motor plate to lift higher than the left side. By pushing down on the right front side you can level the plate and then tighten the front, right screw to secure in a level position.



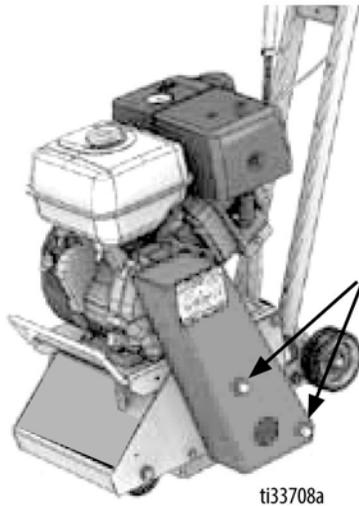
- After installation, use the 3/8" open-end wrench to screw out the belt tensioning jackscrew under the motor plate to tension the belts to your desired tension. Do not over-tension the belt.
- After the correct tension is reached, tighten the front motor plate securing screw on the belt side with the 9/16" box end wrench.



- Tighten the rear securing bolts with the two 9/16" wrenches.
- Tighten the motor plate jackscrew retaining nut with a 9/16" wrench to prevent it from turning.



17. Replace the belt cover using the 3/4" wrench.



Belt Alignment

If the unit has premature belt wear, breakage or pulley problems, the issue may be incorrect alignment or excessive belt tensioning. All pulleys must be aligned directly above each other to ensure belt integrity.

1. Use a long straight edge (carpenters square) to check alignment during belt tensioning or belt replacement time.
2. By laying the straight edge against the outer face of the lower pulley, the square will extend up and rest against the outer face of the upper (engine) pulley. If the straight edge does not rest against the entire face of the engine pulley, move the engine pulley in or out to obtain alignment.
3. If replacing pulleys (top or bottom) be sure to place the pulley on the same plane as the original one to ensure alignment.

Bearing Replacement (FS Series Models)

Tools required:

1. 16mm socket or wrench
2. 1/2" socket or wrench
3. 9/16" socket or wrench
4. 13mm socket or wrench
5. Flat head screw driver
6. Hammer or rubber mallet
7. 6mm hex key

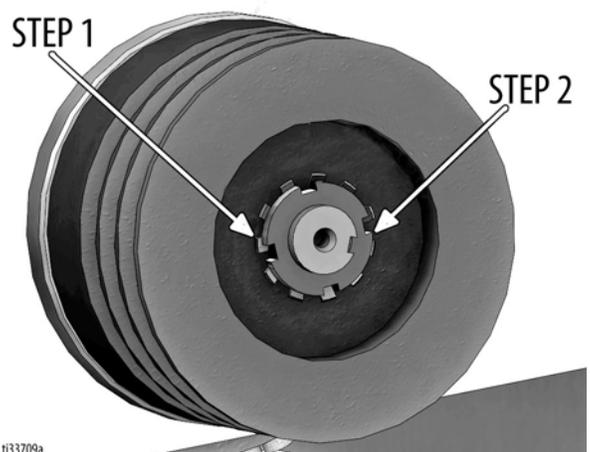


To avoid injury from unexpected start up, disconnect spark plug wire before you service your unit.

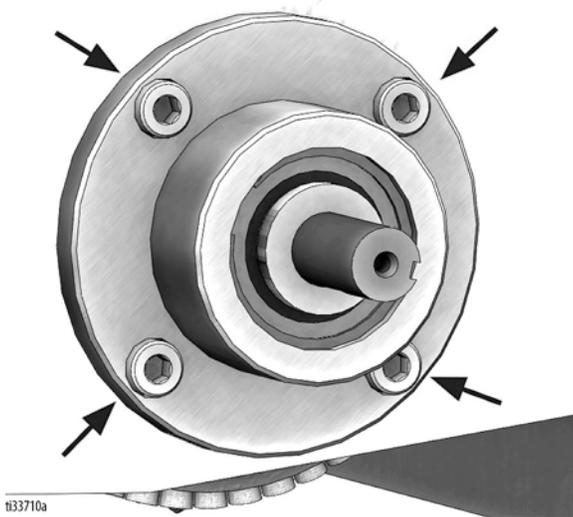
Follow the instructions to remove the drum and belts from the machine, see **Drum Replacement for SMITH FS Series Models** on page 24. Leave the Drum Access Panel aside to remove the bearing housing later.

1. Use a screwdriver to flatten out the tabs that secure the lock nut to the lower pulley.
2. Remove the lock nut on the shaft by putting the screw driver on one of the tabs and hitting it with a hammer or mallet. Remove pulley from shaft.

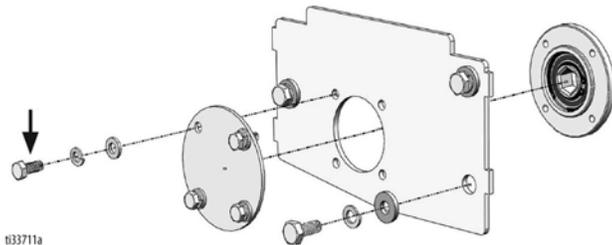
NOTE: The lock nut has left hand threads, therefore it must be rotated clockwise to loosen it.



- Once the pulley is removed, the bearing assembly on that side can be removed using the 6mm hex key.



- Remove the bearing housing from the Drum Access Panel using the 13mm socket or wrench.



- Insert new drive bearing assembly into the drum housing and tighten the bolts. Insert the drive shaft key into the key slot. Tighten lock nut onto shaft.
- Assemble the lower pulley onto the shaft.
- Slide cutter drum onto shaft.
- Install new door bearing onto the Drum Access Panel with the 4 bolts. Assemble the Drum Access Panel onto the unit.
- Replace belt and belt guard (see page 25).

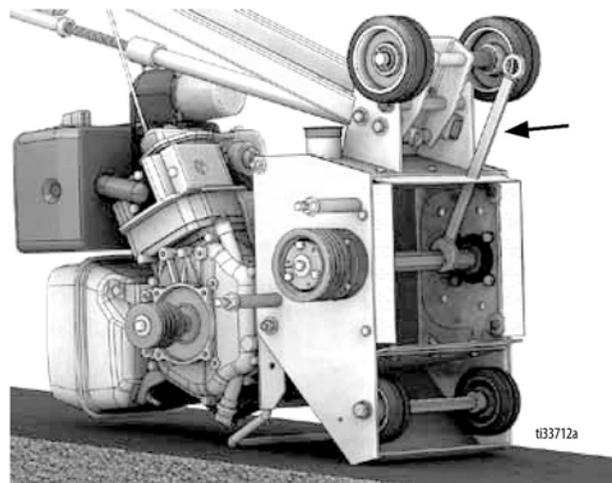
Bearing Replacement (All SPS Series Models)

Tools required:

- 7/16" socket or wrench
- 1/2" socket or wrench
- 1" open-end wrench
- 3/16" Hex Key
- 5/32" Hex Key
- 1/8" Hex Key



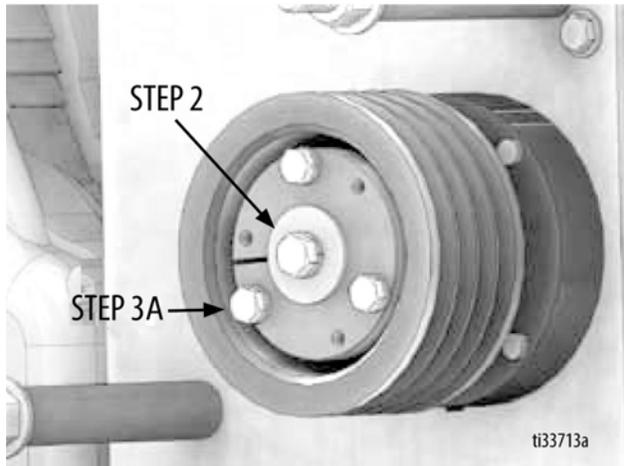
- Tip the machine over towards the FRONT and place the 1" wrench over the hex shaft to prevent it from rotating.



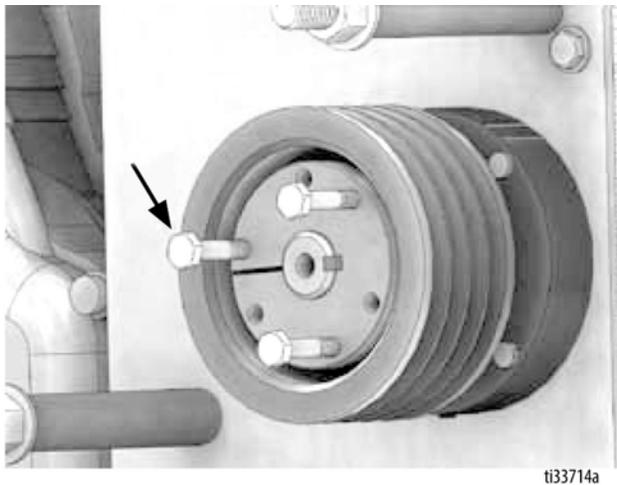
- Remove the center screw using the 1/2" socket.

3. Pulley removal:

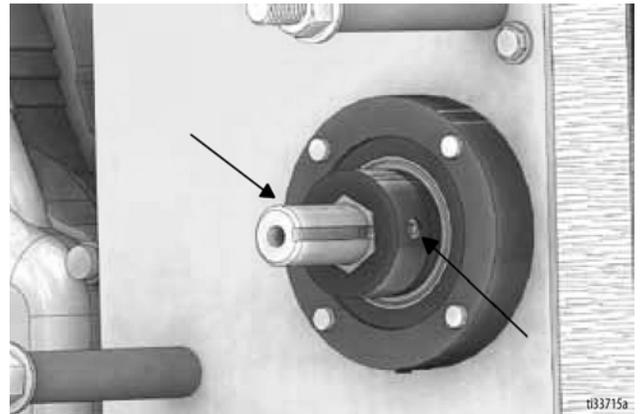
- a. Remove the remaining 3 screws using the 7/16" socket and insert them by hand into the threaded holes as shown below (3B).



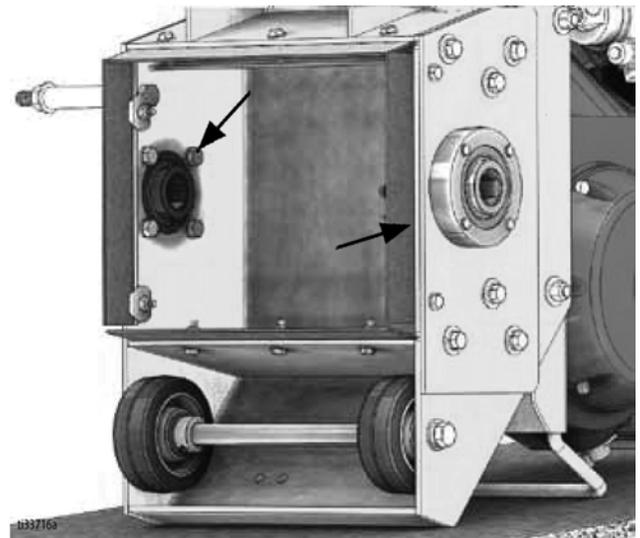
- b. Once all 3 screws are in, begin to turn them using a socket and do so **EVENLY** to allow the bushing to back out smoothly. Once the bushing is out, remove the pulley and key.



4. Slide the shaft out by removing the 2 set screws locking it in place using the 3/16" hex key.



5. Remove the bearing assemblies on both sides on the machine using the 9/16" socket.



6. Install new bearing assemblies onto both sides of machine. Tighten bolts.
7. Slide the shaft all the way into the drive bearing (so that it is fully inserted into the Drum Access Panel Bearing) and lock into place using the 2 set screws (with thread locker).
8. Insert the drive shaft key into the key slot.
9. Assemble lower pulley onto the shaft.
10. Insert all 4 bolts the into lower pulley and tighten.
11. Replace belt and belt guard (see page 27).

Diamond (High Speed) Kit Installation (SPS Series Models Only)



To avoid injury from unexpected start up, disconnect spark plug wire before you service your unit.

The high speed kit is used with the diamond drum assembly only.



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1. Remove belt guard, belt, and both pulleys from the flail (low speed) setup machine.
2. Set the engine pulley aside, and move the lower pulley to the engine's shaft (the bushing required is part of the high speed kit).
3. Place the new pulley and other bushing (included in the kit) onto the drive shaft.
4. Before tightening the pulleys in place with the bushings, put the new belt (included in the kit) into place over the pulleys.
5. Align the pulleys using a straight edge, and tighten them into place with the bushings. Use thread locker on all pulley set screws.
6. Replace belt guard.

Troubleshooting

				
To avoid injury from unexpected start up, disconnect spark plug wire before you service your unit.				

Problem	Cause	Solution
Cutters wearing unevenly/prematurely	Drum is too low	Raise drum
	Material build-up	Clean the cutters
	Cutters too tightly loaded	Remove some spacers or cutters from shafts
	Wrong cutters for application	See 17X074 (Surface Profile Chart)
Cutters shaft breakage unevenly/prematurely	Drum is too low	Raise drum
	End plates or bushings worn	Replace the end plates and/or bushings
	Shafts worn	Replace the shafts
	Wrong cutter set up	Visit www.SMITH.com/drumassembly for proper setup
	Over 40 hours service life	Replace shafts and bushings
Drum wearing prematurely or cracking	Drum hitting ground	Raise drum
	Shafts and bushings not replaced within 40 hours	Replace shafts and bushings
Excessive vibration	Bearing worn	Replace worn bearing
	Hex bushing worn	Replace hex bushing
	Drive shaft worn	Replace drive shaft
	Improper cutter setup	Visit www.SMITH.com/drumassembly for proper setup
	Drum contacting ground	Raise drum
	Wheels worn out	Replace wheels
Machine jumps erratically	Drum hitting ground	Raise drum
	RPM is too low	Increase engine RPM
	Surface is severely uneven	Move to smoother surface
Drive belt wearing prematurely	Pulley is misaligned	Align pulleys/belt. See page 29.
	Wrong belt	Replace with correct belt
	Drum is contacting the surface	Raise drum
Drum Engagement Lever will not raise/lower (non-DCS models only)	Drum Adjustment Dial is set too high or low.	Raise or lower Drum Adjustment Dial
Drum Adjustment Dial will not turn	Threads are dirty or not greased.	Clean and grease the threads
	Linkage may be bent	Replace linkage
Uneven cutting	Cutting too deeply	Raise drum
	Rear wheel fork is bent	Replace rear wheel fork

DCS Models Only

Problem	Cause	Solution
DCS Control not turning on	Blown fuse on DCS Power wire.	Replace fuse on DCS Power wire.
	Power Switch is OFF or damaged.	Turn Power Switch ON. Replace Power Switch if damaged.
	Battery is dead.	Charge Battery.
	DCS Control Board is damaged.	Replace DCS Control Board.
DCS Control runs for short time, then turns off	Engine is not charging the battery. Battery voltage is 14.0-15.0 VDC when engine is full throttle and charging correctly.	Check engine charging coil, voltage rectifier/regulator and fuse inside engine ignition box. Replace or repair if needed.
DCS Control is on, but actuator and/or drum housing does not move	Actuator is disconnected from DCS Control.	Check all connections.
	A DCS Control Switch is pressed or defective.	Ensure all switches are not stuck. Replace switches if defective.
	Actuator rod is stuck.	Manually move the actuator rod using the Manual Height Adjustment feature. Remove screw plug on top of the actuator, then use 6mm hex key to move the rod.
	Actuator or DCS Control Board is damaged.	See flow chart, page 37.
	Battery is low.	Charge battery.
DCS display does not match Cut Depth.	DCS Control needs to recalibrate its position.	Restart the DCS Control.
	Zero Position is not set to the pavement surface.	Reprogram the Zero Position. See DCS Instructions , page 19.
	The wrong SMITH model is selected on the DCS Control.	Select the correct model on DCS Control. See Menu Screens , page 13.
DCS Control Buttons work, but display is blank	The display is unplugged or damaged.	Check that the display ribbon cable and red/white wire are connected inside Control Box. Replace if damaged.

DCS Error Codes

To clear an error code on the DCS Control:

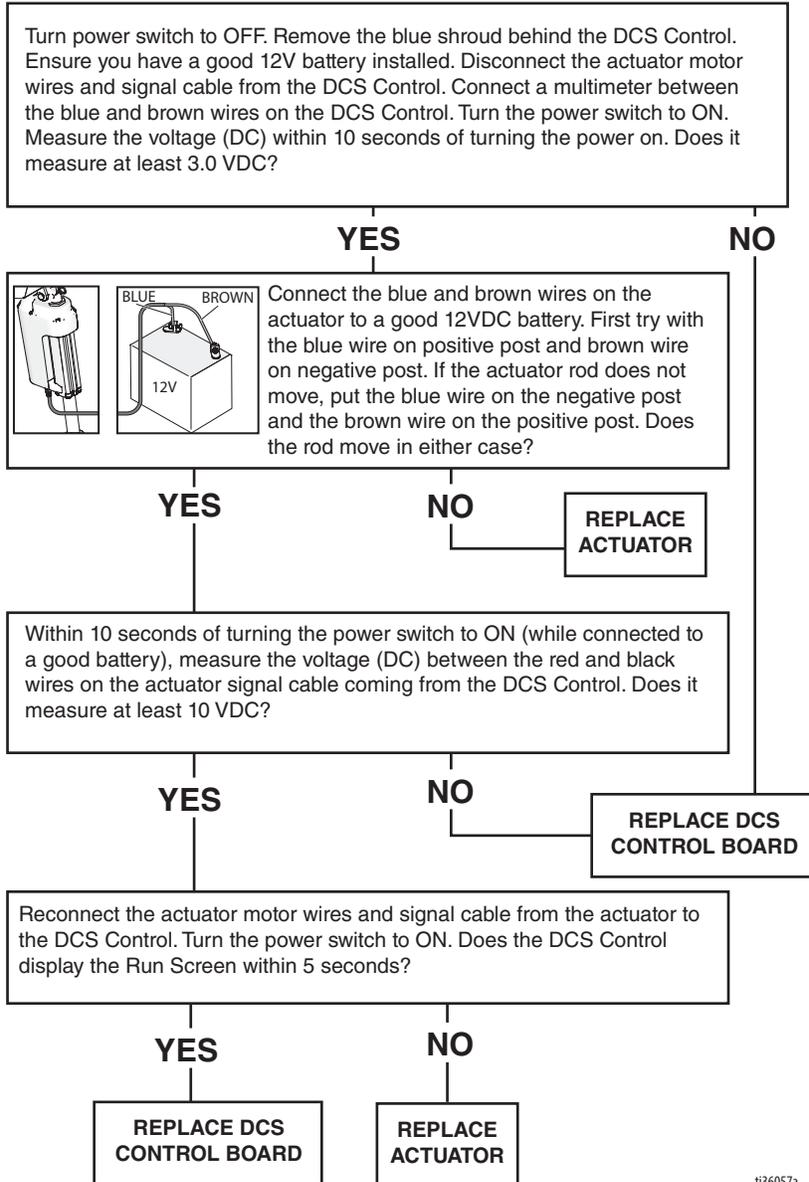
1. Turn DCS Power Switch to OFF.
2. Address/Fix the issue.
3. Turn DCS Power Switch to ON.

Error	Cause	Solution
E04: High Voltage (20VDC or greater, measured across battery posts)	Battery is damaged.	Replace battery.
	Engine voltage rectifier/regulator is damaged.	Replace engine voltage rectifier/regulator.
E05: High Motor Current (15 Amps or greater, measured on blue or brown actuator wire)	Actuator rod is stuck.	Manually move the actuator rod using the Manual Height Adjustment feature.
	Too high of load.	Ensure there is no binding anywhere on the unit when the actuator is moving.
E08: Low Voltage (7VDC or lower, measured across battery posts)	Battery is low/dead.	Charge battery.
	Engine is not charging the battery.	Check the engine charging coil and voltage rectifier/regulator. Replace or repair if needed.
E09: Hall Sensor Error	Actuator Signal Cable is disconnected from DCS Control or is damaged.	Check all connections. Repair or replace if needed.
	Actuator or DCS Control Board is damaged.	See flow chart, page 37.
E12: High Current (short circuit, 60 amps or greater, measured on red or black wire between battery and DCS Control)	A wire or board component has shorted.	Check all wires for shorts. If all wires are okay, the DCS Control board may be damaged and need to be replaced.
E31: Home Button Error	The Home Button is stuck or shorted.	Check to see if Home Button is stuck. If not stuck, replace the Home Button switch.
E32: Zero Button Error	The Zero Button is stuck or shorted.	Check to see if Zero Button is stuck. If not stuck, replace the Zero Button switch.
E33: Cut Depth Button Error	The Cut Depth Button Error is stuck or shorted.	Check to see if Cut Depth Button is stuck. If not stuck, replace the Cut Depth Button switch.

Error	Cause	Solution
E34: Up Button Error	The Up Button or Handlebar Rocker Switch is stuck or shorted.	<p>Disconnect Handlebar Rocker Switch from the DCS Control. Clear the error code.</p> <p>If the error code reappears 30 seconds after turning the Power Switch back ON, the problem is the Up Button on the DCS Control. Check to see if the Up Button is stuck. If not stuck, replace the Up Button Switch.</p> <p>If the error code does not reappear 30 seconds after turning the Power Switch back ON, the problem is the Handlebar Rocker Switch. Check to see if the switch is stuck. If not stuck, replace the Handlebar Rocker Switch.</p>
E35: Down Button Error	The Down Button or Handlebar Switch is stuck or shorted.	<p>Disconnect Handlebar Rocker Switch from the DCS Control. Clear the error code.</p> <p>If the error code reappears 30 seconds after turning the Power Switch back ON, the problem is the Down Button on the DCS Control. Check to see if the Down Button is stuck. If not stuck, replace the Down Button Switch.</p> <p>If the error code does not reappear 30 seconds after turning the Power Switch back ON, the problem is the Handlebar Rocker Switch. Check to see if the switch is stuck. If not stuck, replace the Handlebar Rocker Switch.</p>

DCS Actuator Rod Does Not Move

Use this flow chart if the DCS Actuator Rod does not move or if the DCS displays error code E09 (Hall Sensor Error). Reference **Wiring Diagram**, page 63.



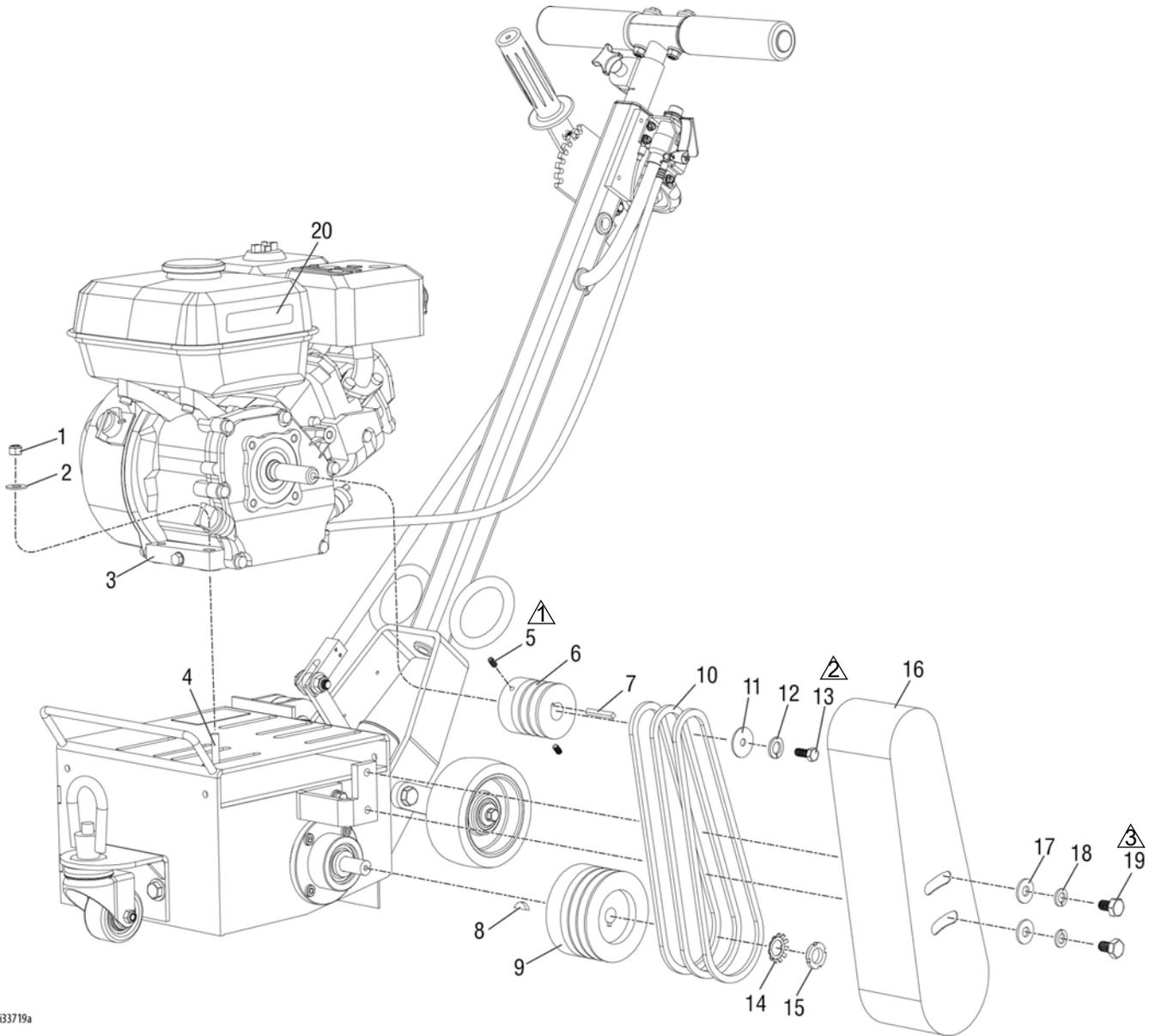
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Parts

Drive Assembly (FS200)

Ref.	Torque
 50-60 in-lb (5.6-6.8 N•m)	
 40-40 in-lb (4.5-5.0 N•m)	
 200-225 in-lb (22.5-25.5 N•m)	

**Use industry standard torques when not specified.*



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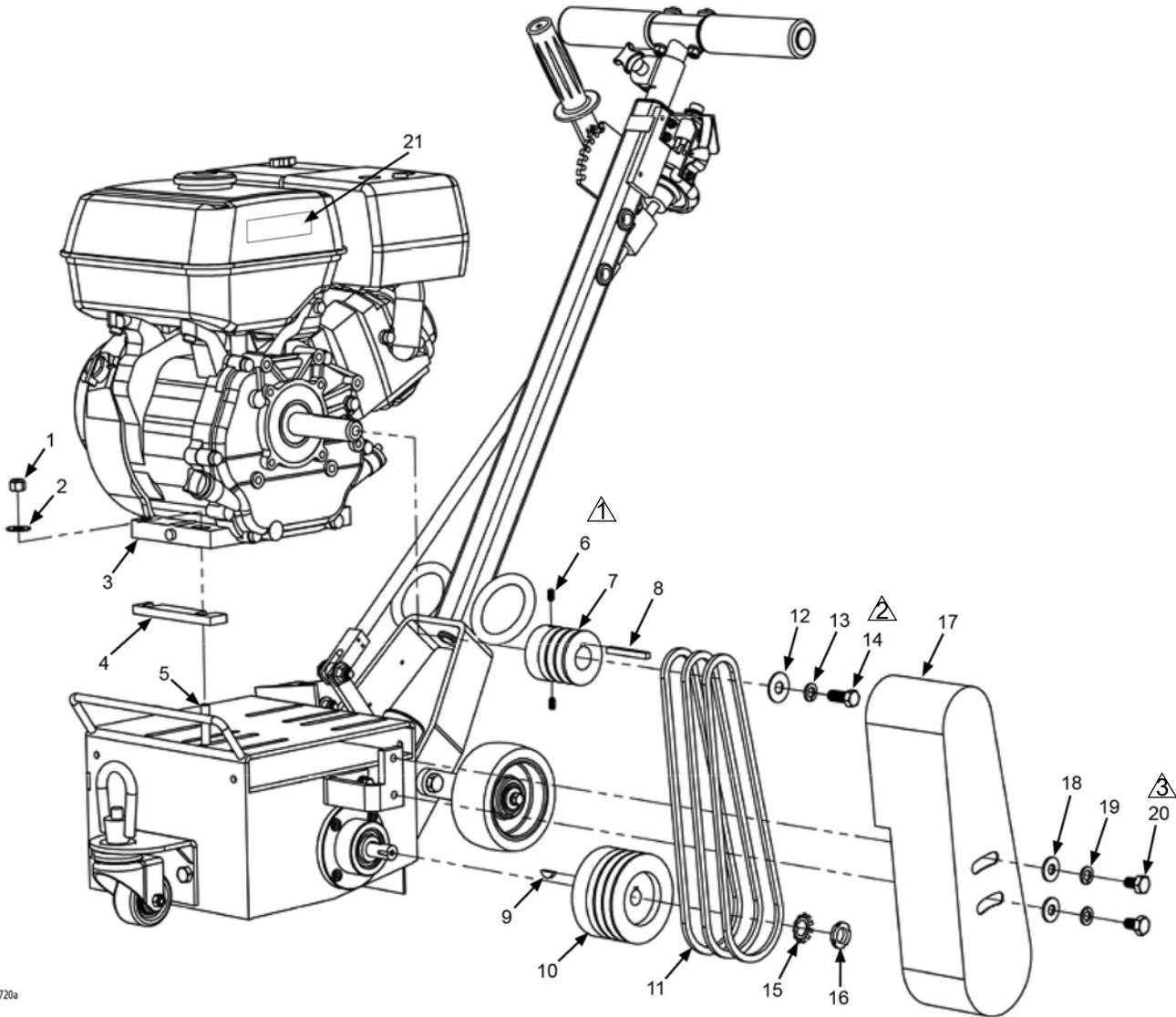
Drive Assembly Parts List (FS200)

Item:	P/N	Description	Qty
1	NHN.312-18	5/16-18 Nut	4
2	FLW.312	5/16" Flat Washer	4
3	RS-E-15026.G	6.5 HP Engine	1
4	CB.312-18x1.5	5/16-18x1.5" Carriage Bolt	4
5	SHSS.M6-1.0x12mm	M5-1.0x12mm Set Screw	2
6	518.1005	Engine Pulley	1
7	17W038	3/16" Key	1
8	979.9021	Woodruff Key	1
9	518.1006	Lower Pulley	1
10	967.1010.722	Drive Belt	3
11	FNW.312-1.25	5/16" 1.25" OD Fender Washer	1
12	SLW.312	5/16" Lock Washer	1
13	HX-CS.312-18x1.75	5/16-24x1" Hex Cap Screw	1
14	979.1021.1	Tabbed Washer	1
15	979.9020.1LH	Slotted Lock Nut	1
16	505.1001	Belt Guard	1
17	FNW.M10-30mm	M10 30mm OD Fender Washer	2
18	SLW.M10	M10 Lock Washer	2
19	HX-CS.M10-1.5x16mm	M10-1.5x16mm Hex Cap Screw	2
20	194126	Warning Label, Fire and Explosion	1
<i>Replacement warning, safety labels, tags, and cards are available at no cost.</i>			

Drive Assembly (FS209)

Ref.	Torque
 50-60 in-lb (5.6-6.8 N•m)	
 40-40 in-lb (4.5-5.0 N•m)	
 200-225 in-lb (22.5-25.5 N•m)	

**Use industry standard torques when not specified.*



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Drive Assembly Parts List (FS209)

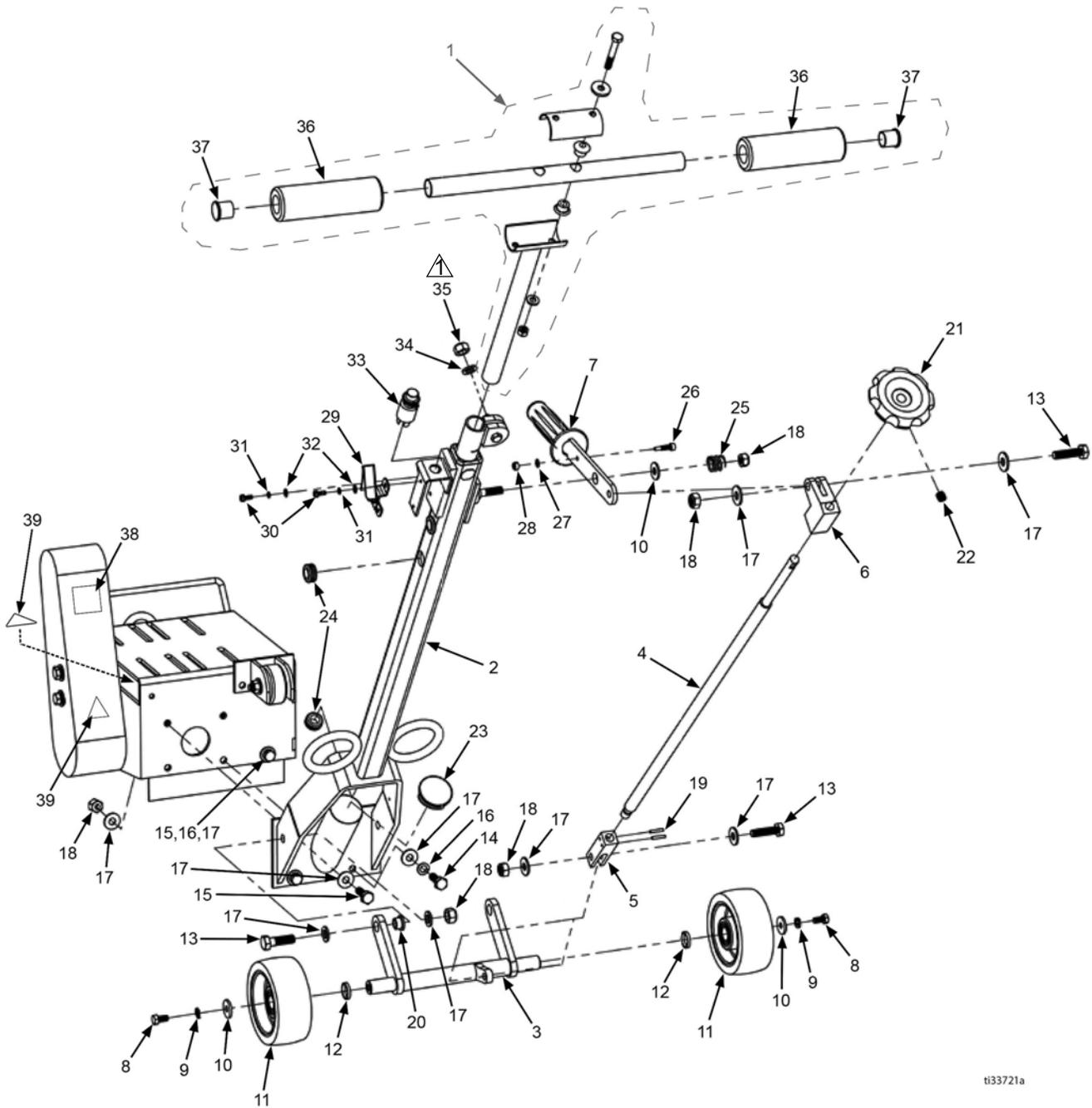
Item:	P/N	Description	Qty
1	NHN.375-16	3/8-16 Nut	4
2	FLW.375	3/8" Flat Washer	4
3	RS-E-15027	9 HP Engine	1
4	518.1011	Engine Spacer	2
5	CB.375-16X2	3/8-16x2" Carriage Bolt	4
6	SHSS.M6-1.0x12mm	M6-1.0x12mm Set Screw	2
7	518.1009	Engine Pulley	1
8	17W088	1/4" Key	1
9	979.9021	Woodruff Key	1
10	518.1006	Lower Pulley	1
11	967.1010.787	Drive Belt	3
12	FNW.437-1.25	7/16" 1.25" OD Fender Washer	1
13	SLW.437	7/16" Lock Washer	1
14	HX-CS.437-20x1	7/16-20x1" Hex Cap Screw	1
15	979.1021.1	Tabbed Washer	1
16	979.9020.1LH	Slotted Lock Nut	1
17	505.1002	Belt Guard	1
18	FNW.M10-30mm	M10 30mm OD Fender Washer	2
19	SLW.M10	M10 Lock Washer	2
20	HX-CS.M10-1.5x16mm	M10-1.5x16mm Hex Cap Screw	2
21	194126	Warning Label, Fire and Explosion	1

Replacement warning, safety labels, tags, and cards are available at no cost.

Guide Bar Assembly (FS200 and FS209)

Ref.	Torque
 100-110 in-lb (11.3-12.4 N•m)	

**Use industry standard torques when not specified.*



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Guide Bar Assembly (FS200 and FS209) Parts List

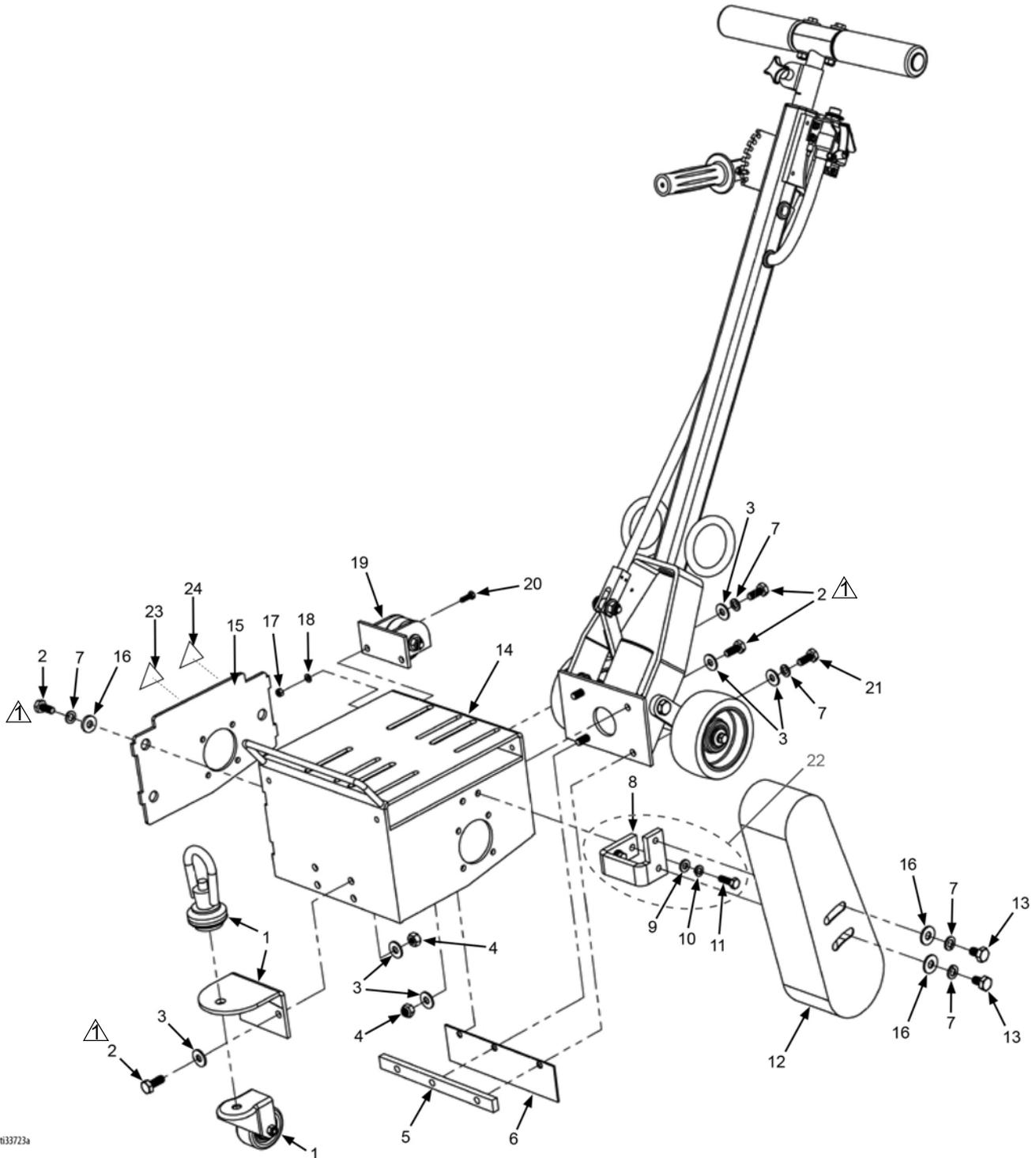
Item:	P/N	Description	Qty
1	510.1020.D	Handlebar Assembly	1
2	510.1000.D	Guide Bar	1
3	515.1007	Wheel Carrier	1
4	516.1000.16	Height Adjustment Rod	1
5	516.1006D	Lower Height Adjustment Clevis	1
6	516.1005D	Upper Height Adjustment Clevis	1
7	516.1008D.A	Height Adjustment Lever Assembly	1
8	HX-CS.M8-1.0x20mm	M8-1.25x20mm Hex Cap Screw	2
9	SLW.M8	M8 Lock Washer	2
10	FNW.M10-30mm	M10-30mm OD Fender Washer	3
11	905.1000.1FS	Rear Wheel Assembly	2
12	515.1007.1	Rear Wheel Spacer	2
13	HX-CS.M10-1.5x40mm	M10-1.5x40mm Hex Cap Screw	4
14	HX-CS.M10-1.5x30mm	M10-1.5x30mm Hex Cap Screw	2
15	HX-CS.M10-1.5x25mm	M10-1.5x25mm Hex Cap Screw	3
16	SLW.M10	M10 Lock Washer	3
17	FLW.M10	M10 Flat Washer	11
18	NHN.M10-1.5	M10-1.5 Nylon Nut	6
19	516.1006D.1	Lower Clevis Spring Pin	2
20	516.1007.2	Brass Bushing	2
21	516.1012	Height Adjustment Hand Knob	1
22	SHSS.M10-1.5x10mm	M10-1.5x10mm Set Screw	1
23	PL-CAP.1.75	Vacuum Port Cap	1
24	RB-GROM.625	5/8" ID Rubber Grommet	3
25	510.1000D.13	Height Adjustment Lever Spring	1
26	516.1008D.1	Height Adjustment Locator Pin	1
27	SLW.M6	M6 Lock Washer	1
28	HN.M6-1.0	M6-1.0 Hex Nut	1
29	1036111	Throttle Cable	1
30	HX-CS.M5-0.8x10mm	M5-0.8x10mm Hex Cap Screw	4
31	SLW.M5	M5 Lock Washer	4
32	FLW.M5	M5 Flat Washer	4
33	1050010A	Kill Switch Assembly	1
34	FLW.M8	M8 Flat Washer	1
35	NHN.M8-1.25	M8-1.25 Nylon Nut	1
36	GRIP62-200	Foam Grip	2
37	PL-CAP.0.875	7/8" ID Plastic Tube Cap	2
38	17W298	Warning Label, Multiple	1
39	16C394	Warning Label, Entanglement	2

Replacement warning, safety labels, tags, and cards are available at no cost.

Primary Housing Assembly (FS200 and FS209)

Ref.	Torque
 28-30 ft-lb (38-40 N•m)	

*Use industry standard torques when not specified.



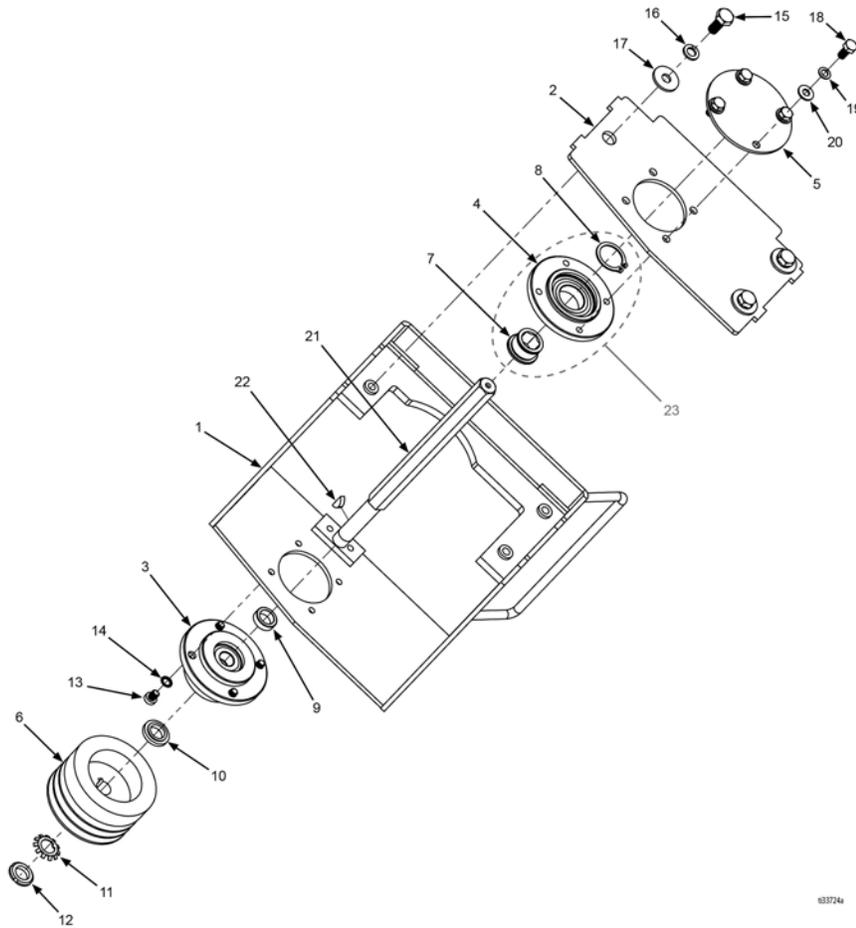
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Primary Housing Assembly (FS200 and FS209) Parts List

Item:	P/N	Description	Qty
1	510.1020.D2	Front Caster Wheel Assembly	1
2	HX-CS.M10-1.5x25mm	M10-1.5x2.5mm Hex Cap Screw	8
3	FLW.M10	M10 Flat Washer	11
4	NHN.M10-1.5	M10-1.5 Nylon Nut	4
5	511.1021.240	Dust Flap Retention Bar	1
6	511.1022.240	Dust Flap	1
7	SLW.M10	M10 Lock Washer	8
8	511.1060	Belt Guard Bracket	1
9	FLW.M8	M8 Flat Washer	2
10	SLW.M8	M8 Lock Washer	2
11	HX-CS.M8-1.25X25mm	M8-1.25x25mm Hex Cap Screw	2
12	505.1001	Belt Guard (model FS200)	1
	505.1002	Belt Guard (model FS209)	1
13	HX-CS.M10-1.5x16mm	M10-1.5x16mm Hex Cap Screw	2
14	511.1063	Main Housing	1
15	511.1055.2	Side Plate	1
16	FNW.M10-30mm	M10-30mm OD Fender Washer	5
17	NHN.M6-1.0	M10-1.5 Nylon Nut	1
18	FLW.M6	M6-1.0 Nylon Nut	1
19	510.1020.D1	M6 Flat Washer	1
20	HX-CS.M6-1.0x20mm	M6-1.0x20mm Hex Cap Screw	1
21	HX-CS.M10-1.5x30mm	M10-1.5x30mm Hex Cap Screw	2
22	511.1060A	Belt Guard Bracket Assembly	1
23	16C393	Warning Label, Foot Cut	1
24	16D646	Warning Label, Hot Surface	1
<i>Replacement warning, safety labels, tags, and cards are available at no cost.</i>			

Drum Housing Assembly (FS200 and FS209)

*Use industry standard torques when not specified.



Drum Housing Assembly (FS200 and FS209) Parts List

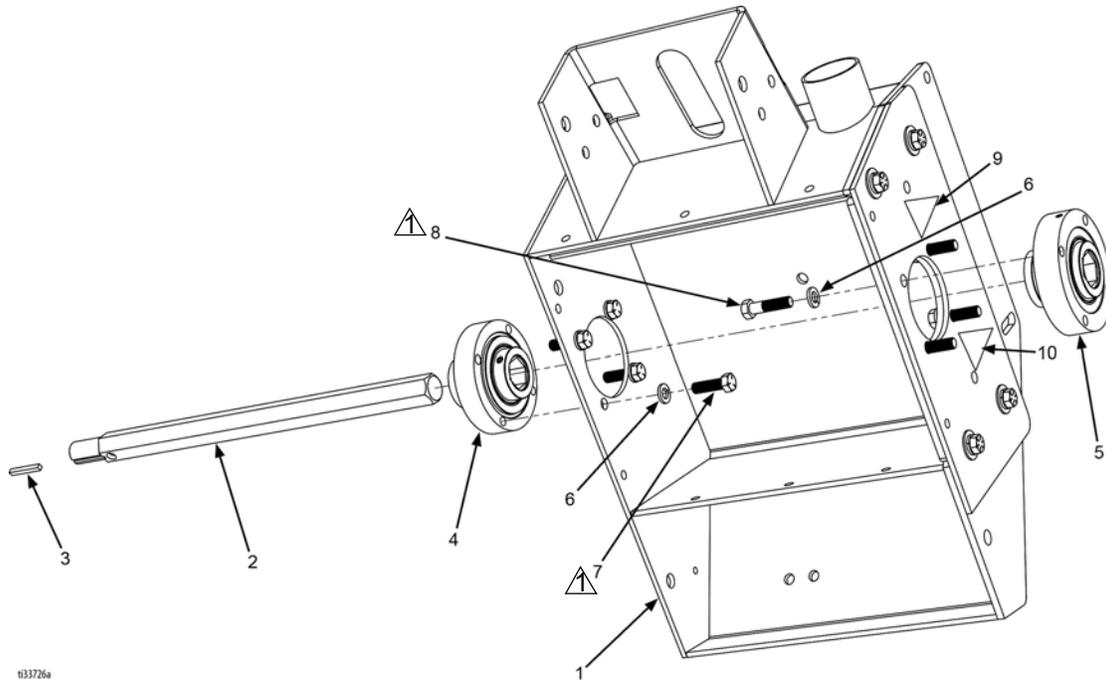
Item:	P/N	Description	Qty
1	511.1063	Main Housing	1
2	511.1055.2	Side Plate	1
3	512.1000A	Drive Side Bearing Assembly	1
4	512.1002	Side Plate Bearing Assembly	1
5	511.1020	Side Plate Bearing Cover	1
6	518.1006	Lower (Drive) Pulley	1
7	514.1000	Hex Bushing	1
8	977.1010.30	Hex Bushing C-Clip	1
9	109.1033.7	Shaft Spacer	1
10	506.1007	Pulley Spacer	1
11	979.1021.1	Tabbed Washer	1
12	979.9020.1LH	Slotted Left-Handed Lock Nut	1
13	LPSHCS.M8-1.25x10mm	M8-1.25x10mm Low Profile Socket Cap Screw	4
14	BSLW.M8	M8 Belleville Washer	4
15	HX-CS.M10-1.5x25mm	M10-1.5x25mm Hex Cap Screw	3
16	SLW.M10	M10 Lock Washer	3
17	FNW.M10-30mm	M10-30mm OD Fender Washer	3
18	HX-CS.M8-1.25x18mm	M8-1.25x18mm Hex Cap Screw	4

19	SLW.M8	M8 Lock Washer	4
20	FLW.M8	M8 Flat Washer	4
21	513.1000.1	Hex Drive Shaft	1
22	979.9021	Woodruff Key	1
23	512.1002A	Side Plate Bearing Assembly	1

Bearing and Shaft Assembly (SPS10, SPS10 DCS)

Ref.	Torque
	30-32 ft-lb (40-43 N•m)

*Use industry standard torques when not specified.



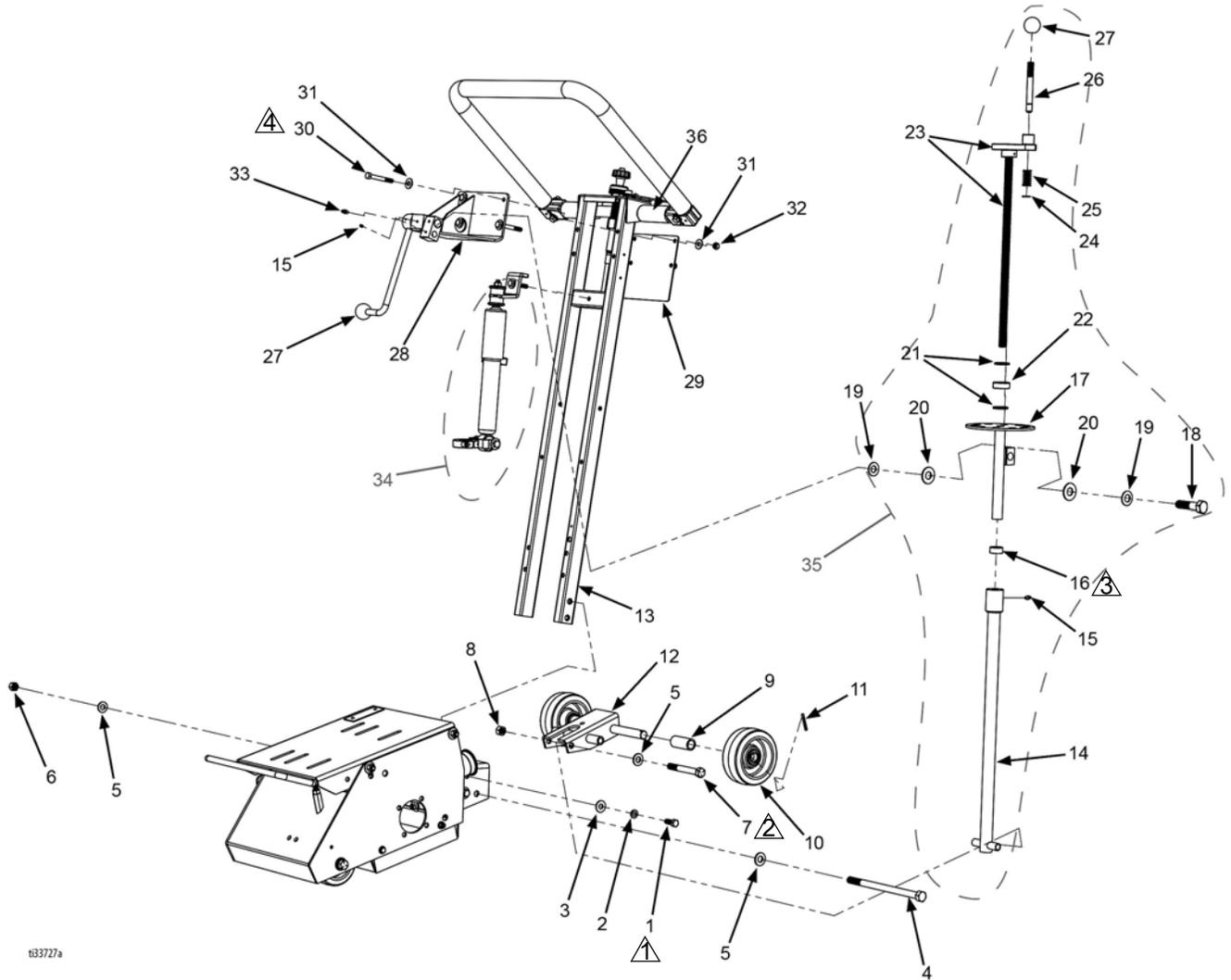
Bearing and Shaft Assembly (SPS10, SPS10 DCS) Parts List

Item:	P/N	Description	Qty
1	1065001	Main frame	1
2	1065037	Drive shaft	1
3	17W038	Shaft key	1
4	1065031A-SM	Drive side bearing assembly	1
4*	1065031A-HS	Drive side bearing assembly	1
5	1065033A-SM	Side plate bearing assembly	1
5*	1065033A-HS	Side plate bearing assembly	1
6	SLW.375	3/8" Lock Washer	8
7	HX-CS.375-24x1.25	3/8-24x1.25" Hex Cap Screw	4
8	HX-CS.375-24x1.5	3/8-24x1.5" Hex Cap Screw	4
9▲	16C393	Warning label, Foot Cut	2
10▲	16D646	Warning label, Hot Surface	1
▲ Replacement warning, safety labels, tags, and cards are available at no cost.			
* For a machine set up for high speed (diamond) applications.			

Rear Assembly (SPS10)

Ref.	Torque
	24-26 ft-lb (32.5-35.3 N•m)
	180-200 in-lb (20.3-22.6 N•m)
	70-75 in-lb (7.9-8.5 N•m)
	160-170 in-lb (18.1-19.2 N•m)

*Use industry standard torques when not specified.



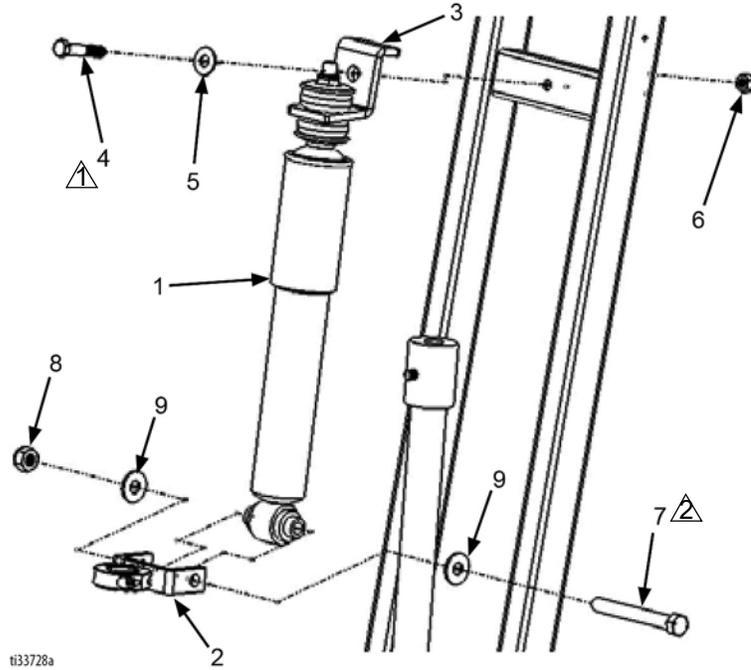
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Rear Assembly (SPS10) Parts List

Item:	P/N	Description	Qty
1	HX-CS.375-16x1	3/8-16x1" Hex Cap Screw	4
2	SLW.375	3/8" Lock Washer	4
3	FLW.375	3/8" Flat Washer	4
4	HX-CS.50-13x8	1/2-13x8" Hex Cap Screw	1
5	FLW.50	1/2" Flat Washer	3
6	NHN.50-13	1/2-13 Nylon Nut	1
7	HX-CS.50-20x4	1/2-20x4" Hex Cap Screw	1
8	NJN.50-20	1/2-20 Nylon Jam Nut	1
9	17W058	Wheel Spacer	2
10	17W031	Wheel (rear)	2
11	17W059	Cotter Pin	2
12	65004-1	Rear Fork	1
13	18A674	Main Handlebar Frame	1
14	17Y172	Lower Linkage LH	1
14	1065006	Lower Linkage RH	
15	17W045	Grease Fitting	2
16	17W056	Locking Collar	1
17	17Y822	Upper Linkage 10 Hole	1
17	1065007.E	Upper Linkage 6 Hole	
18	HX-CS.625-11x2.5	5/8-11x2.5" Hex Cap Screw	1
19	1065040	Belleville Washer	2
20	1065041	Bronze Washer	2
21	17W105	Structural Washer	2
22	17W054	Thrust Bearing	1
23	17Y998	Hand Wheel Assembly LH	1
23	1065019	Hand Wheel Assembly RH	
24	17W127	E-Clip	1
25	17W111	Spring	1
26	17W119	Locator Pin	1
27	17W049	Ball Knob	2
28	65009.25.E	Cam Lever	1
29	65009.25.1	Handlebar Back Plate	1
30	HX-CS.312-18x2.5	5/16-18x2.5" Hex Cap Screw	4
31	FLW.312	5/16" Flat Washer	8
32	NHN.312-18	5/16-18 Nylon Nut	4
33	SHSS10-32x.25	#10-32x0.25" Set Screw	1
34	SPS.DLX.ACC	Damper Assembly	1
35	65007A	Linkage/Hand Wheel Assembly RH	1
35	17W956	Linkage/Hand Wheel Assembly LH	
36	10608	Handle SMITH (Model SPS8)	2

Damper Assembly (SPS10)

Ref.	Torque
	150-160 in-lb (16.9-18.1 N•m)
	95-105 in-lb (10.7-11.9 N•m)



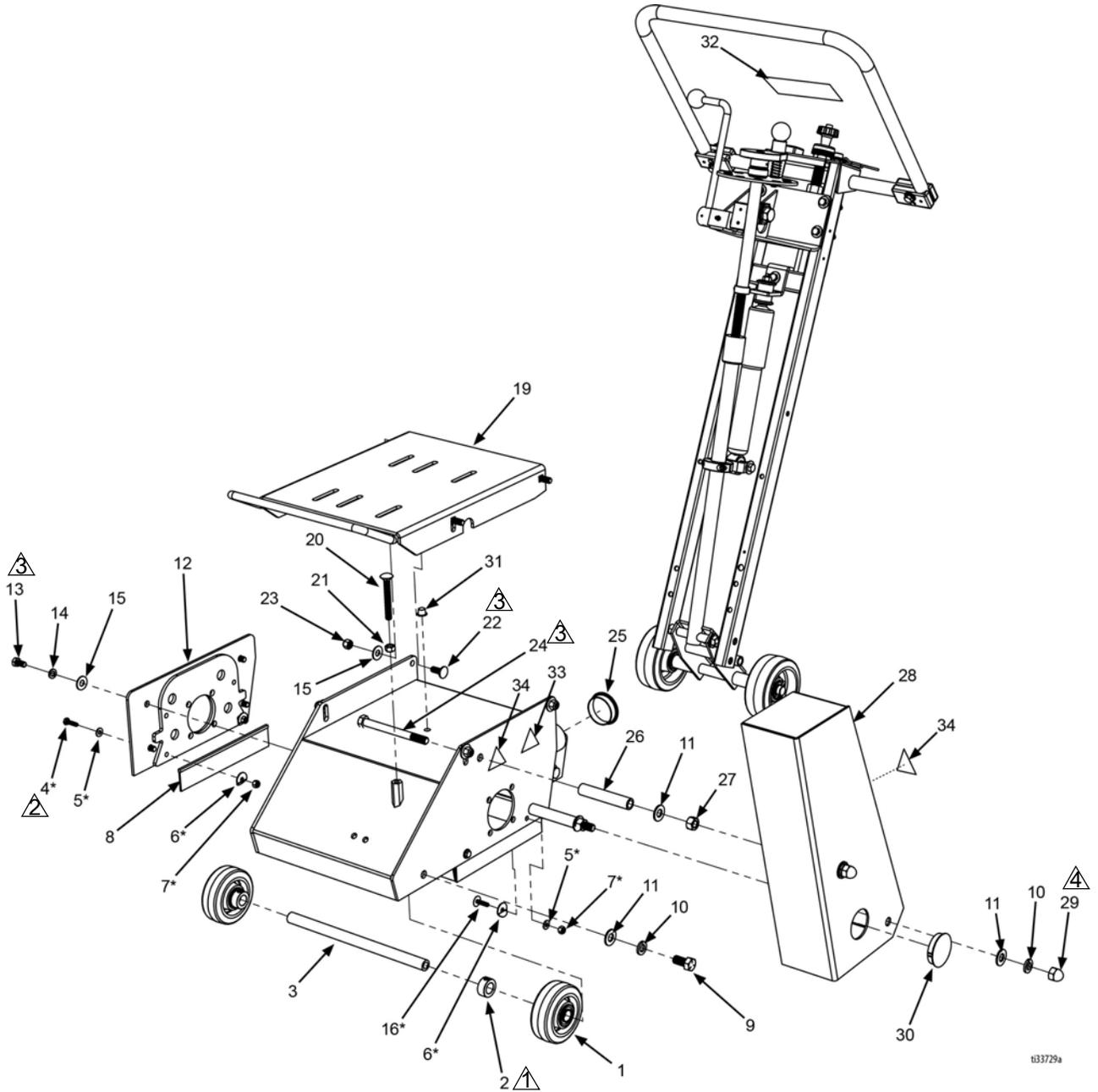
Damper Assembly (SPS10) Parts List

Item:	P/N	Description	Qty
1	17W126	Shock Absorber	1
2	17W123	Lower Attachment Link	1
3	17W122	Upper Attachment Link	1
4	HX-CS.312-18x1.75	5/16-18x1.75" Hex Cap Screw	1
5	FLW.312	5/16" Flat Washer	1
6	NHN.312-18	5/16-18 Nylon Hex Nut	1
7	HX-CS.375-16x3.5	3/8-16x3.5" Hex Cap Screw	1
8	NHN.375-16	3/8-16 Nylon Nut	1
9	FLW.375	3/8" Flat Washer	2
10	SPS.DLX.ACC	Damper Assembly (incl. items 1-9)	1

Front Assembly (SPS10, SPS10 DCS)

Ref.	Torque
	120-140 in-lb (13.6-15.8 N•m)
	55-65 in-lb (6.2-7.3 N•m)
	22-24 ft-lb (29.8-32.5 N•m)
	19-21 ft-lb (25.8-28.5 N•m)

Use industry standard torques when not specified.



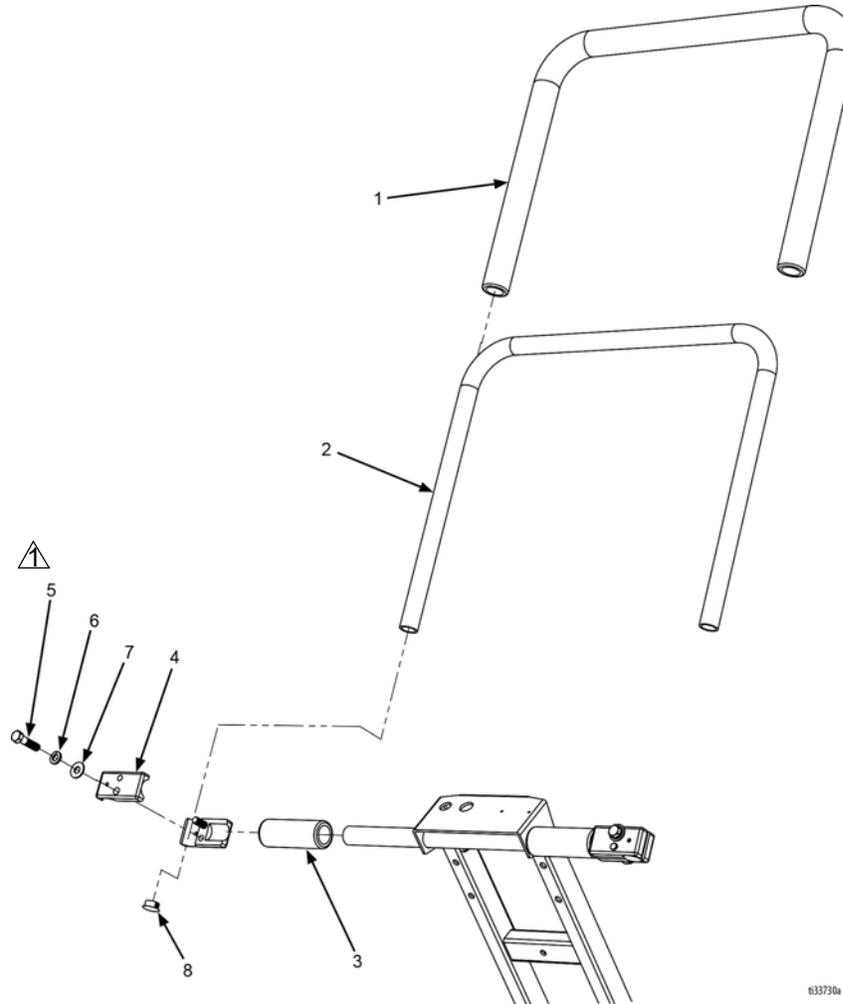
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Front Assembly (SPS10, SPS10 DCS) Parts List

Item:	P/N	Description	Qty
1	17W030	Front Wheel (with bearings)	2
2	17W072	Locking Collar	2
3	17W032	Axle Shaft	1
4*	HX-CS.25-20x1	1/4-20x1" Hex Cap Screw	9
5*	FLW.25	1/4" Flat Washer	10
6*	FNW.25-1.0	1/4" Fender Washer	10
7*	NHN.25-20	1/4-20 Nylock Nut	10
8	65036.A	Brush Strip Assembly (set of 4)	1
9	HX-CS.50-20x1	1/2-20x1" Hex Cap Screw	2
10	SLW.50	1/2" Lock Washer	4
11	FLW.50	1/2" Flat Washer	6
12	1065010	Side Plate	1
13	HX-CS.375-24x.75	3/8-24x0.75" Hex Cap Screw	4
14	SLW.375	3/8" Lock Washer	4
15	FLW.375	3/8" Flat Washer	8
16*	LPMS.25-20x1.0	1/4-20x1" Low Profile Screw	1
19	65002	Engine Mount (Model SPS8)	1
	18A675	Engine Mount (Model SPS10 & SPS10)	1
20	CB.375-16x3	3/8-16x3" Carriage Bolt	1
21	HN.375-16	3/8-16 Hex Nut	1
22	CB.375-16x1	3/8-16x1" Carriage Bolt	4
23	NHN.375-16	3/8-16 Nylon Nut	4
24	HX-CS.50-13x5.25	1/2-13x5.25" Hex Cap Screw	2
25	65021	Cap Plug	2
26	17W068	Spacer	2
27	HN.50-13	1/2-13 Hex Nut	2
28	17W018	Belt Guard	1
29	AHN.50-13	1/2-13 Acorn Nut	2
30	17W066	Hole Plug (Belt Guard)	1
31	17W957	Hole Plug (Housing)	1
32▲	LB-50013	Warning Label, Multiple (Model SPS10 & SPS8)	1
	18A678	Warning Label, Multiple (Model SPS10)	1
33▲	16C393	Warning Label, Foot Cut	1
34▲	16C394	Warning Label, Entanglement	2
▲ Replacement warning, safety labels, tags, and cards are available at no cost.			
* Items are part of item 8.			

Handle Bar Assembly (SPS10)

Ref.	Torque
	22-24 ft-lb (29.8-32.5 N•m)



Handle Bar Assembly (SPS10) Parts List

Item:	P/N	Description	Qty
1	17W281	Long Handle Bar Grip (49" Long)	1
2	17W005	Handle Bar Tubing	1
3	17W002	Short Handle Bar Grip (4" Long)	2
4	17W003	Handle Bar Clamp	4
5	HX-CS.375-16x1.5	3/8-16x1.5" Hex Cap Screw	4
6	SLW.375	3/8" Lock Washer	4
7	FLW.312	5/16" Flat Washer	4
8	17W009	3/4" Plastic Tube Cap	2

Drive Assembly (SPS10, SPS10 DCS) Parts List

Item:	P/N	Description	Qty
1	RS-E-15029	13hp Engine (Model SPS10)	1
	17Y714	13hp Engine (Model SPS10 DCS)	1
2	CB.375-16x1.75	3/8-16x1.75" Carriage Bolt	4
3	FLW.375	3/8" Flat Washer	4
4	NHN.375-16	3/8-16 Nylock Nut	4
5	SPSTH-HD-SPS	Throttle Cable Assembly	1
6	1065011A	Kill Switch Assembly	1
7	RS-18331-ZE3-811	Deflector for Honda Engine	1
8	17W088	Key for Engine Pulley	1
9	HX-CS.375-24x1	3/8-24x1" Hex Cap Screw	1
10	SLW.375	3/8" Lock Washer	1
11	FNW.375-1.25	3/8" Fender Washer	1
12	HX-CS.312-24x.75	5/16-24x0.75" Hex Cap Screw	1
13	SLW.312	5/16" Lock Washer	1
14	FNW.312-1.25	5/16" Fender Washer	1
15	17W038	Key for Drive Pulley	1
16	17W284	Tachometer/Hour Meter	1
17*	17W129	Throttle Cable Mount	1
18*	17W130	Throttle Cable Screw	1
19*	RS-90605-230-000	Throttle Mount C-Clip	1
20*	RS-90055-ZE1-000	Deflector Mounting Screw	3
21▲	194126	Warning Label, Fire and Explosion	1

▲ Replacement warning, safety labels, tags, and cards are available at no cost.

Flail (Low Speed) Set Up

Item:	P/N	Description	Qty
A	17W034	Engine Pulley	1
B	N/A	Engine Pulley Bushing	1
C	17W036	Drive Pulley	1
D	17W037	Drive Pulley Bushing	1
E	17W035	Drive Belt	1

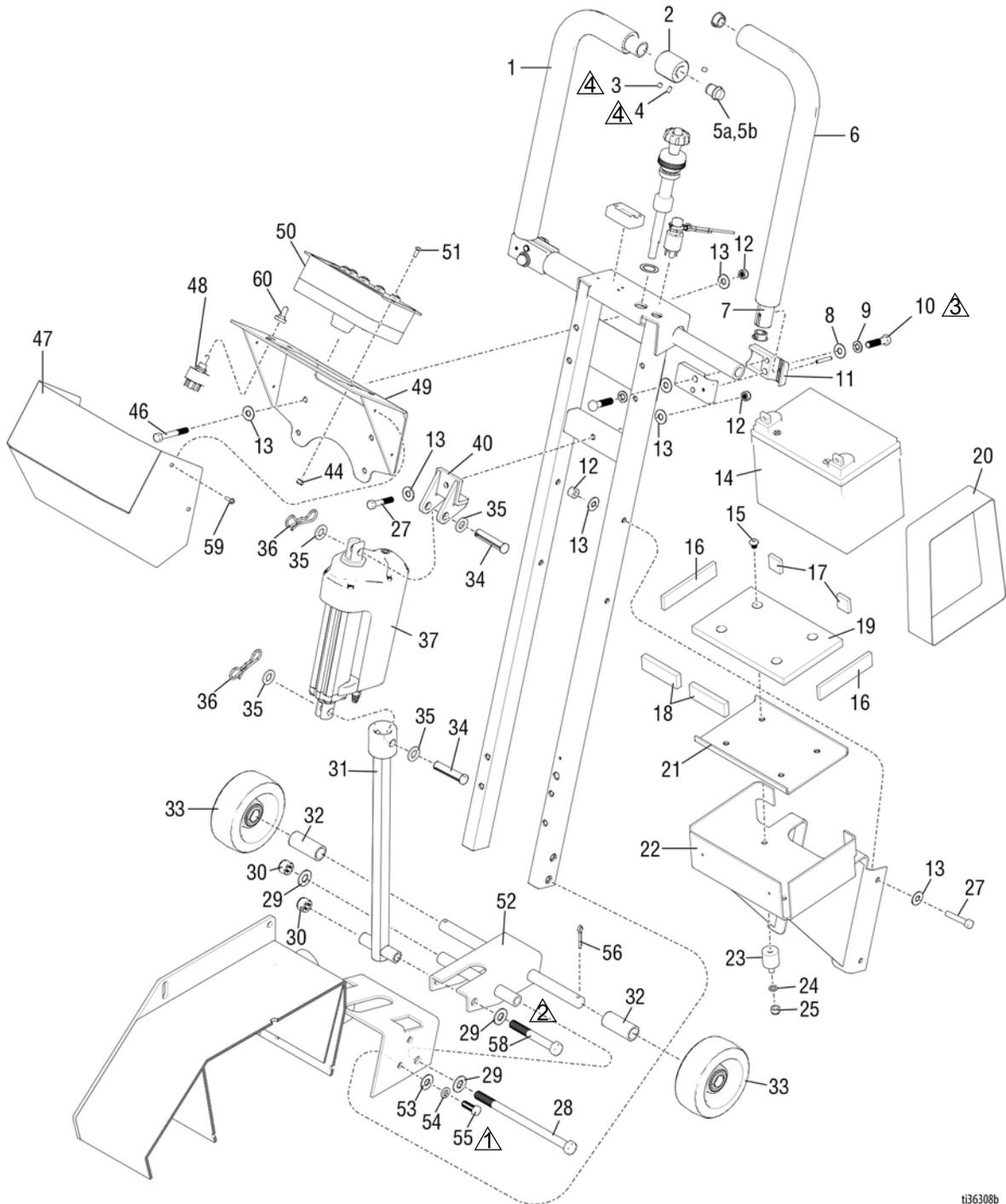
Diamond (High Speed) Set Up

Item:	P/N	Description	Qty
A	17W036	Engine Pulley	1
B	1010559	Engine Pulley Bushing	1
C	X3.00.219.1	Drive Pulley	1
D	X3.00.220.3	Drive Pulley Bushing	1
E	17W035.W	Drive Belt	1

NOTE: Bearing assemblies (P/N 1065031A-HS and 1065033A-HS) are required when the machine is to be used for high speed diamond blade applications (see **Bearing and Shaft Assembly (SPS10, & SPS10 DCS)** on page 48.

Rear Assembly (SPS10)

Ref.	Torque
 1	24-26 ft-lb (32.5-35.3 N•m)
 2	180-200 in-lb (20.3-22.6 N•m)
 3	240-264 in-lb (27.1-30.0 N•m)
 4	72-84 in-lb (8.1-9.5 N•m)



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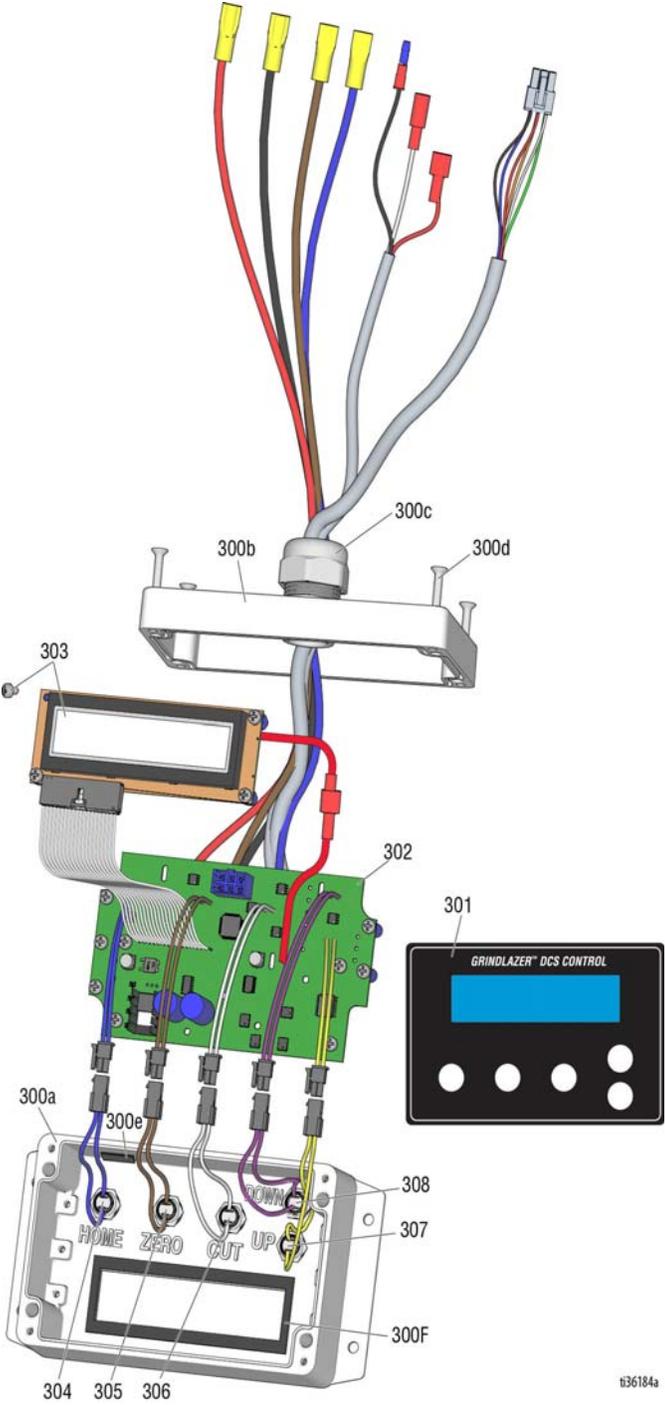
Rear Assembly (SPS10 DCS)

Parts List

Item:	P/N	Description	Qty
1	17W281.4R	Foam Grip, Right	1
2	17Y120	Control Switch Housing	1
3	100002	1/4"-20 x 1/4" Set Screw	2
4	SHS510-32x3.75	10-32 x 3/8" Set Screw	1
5a	17Y999	Rocker Switch	1
5b	18A120	Rocker Switch Wire Assembly	1
6	17W281.4L	Foam Grip, Left	1
7	18A350	Handle Bar Tubing	2
8	FLW.312	5/16" Flat Washer	4
9	SLW.375	3/8" Lock Washer	4
10	HX-CS.375-16x1.5	3/8-16 x 1.5" Hex Cap Screw	4
11	17W003	Handle Bar Clamp	4
12	110838	Nut, Nylock	9
13	120454	Washer, Flat	19
14	115753	Battery, 33 ah	1
15	18A547	Fastener, 5/16-18 x 0.375	4
16	18Y701	Foam, Urethane, 1/4"	2
17	18A651	Foam, Urethane, 1/4"	2
18	18Y702	Foam, Urethane, 3/8"	2
19	18A700	Foam, Urethane, 1/2"	1
20	17Z663	Strap, Velcro, 2"	1
21	18A600	Plate Battery	1
22	17Z142	Battery Bracket Assembly	1
23	17A720	Dampener	4
24	305156	Washer, Flat	4
25	111040	Nut, Lock, Insert, Nylon	4
27	108843	Screw, Cap, Hex, 5/16-18 x 1.75	5
28	HX-CS.50-13x8	1/2-13 x 8" Hex Cap Screw	1
29	FLW.50	1/2" Flat Washer	3
30	NHN.50-13	1/2-13 Nylon Nut	1
31	17Z140	Lower Linkage	1
32	17W058	Wheel Spacer	2
33	17W031	Wheel (rear)	2
34	18A114	Pin	2
35	FLW.M12	Flat Washer, M12	4
36	17Y962	Cotter Pin, Bow Tie	2
37	17Y237	Actuator, Linear 12V, 3" stroke	1
40	17Z139	Upper Linkage	1
44	NHN10.32	Nut, Nylock, 10-32	4
46	HX-CS.312-18x2.5	5/16-18x2.5 HEX CAP SCREW	4
47	18A788	Cover	1
48	17Z193	Switch, Toggle	1
49	17Z143	Control Box Bracket	1
50	18A790	Kit, Assembly, Control DCS	1
51	116610	Screw, Mach, Phil, Pan, #10	4
52	65004-1	Rear Fork	1
53	FLW.375	3/8" Flat Washer	4
54	SLW.375	3/8" Lock Washer	4
55	HX-CS.375-16x1	3/8-16x1" Hex Cap Screw	4
56	17W059	Cotter Pin	2
58	HX-CS.50-20x4	1/2-20x4" Hex Cap Screw	1
59	117501	Screw, Mach, Slot Hex Head	4
60	17Z340	Boot, Toggle	1

DCS Control Box 18A790

SPS10 only



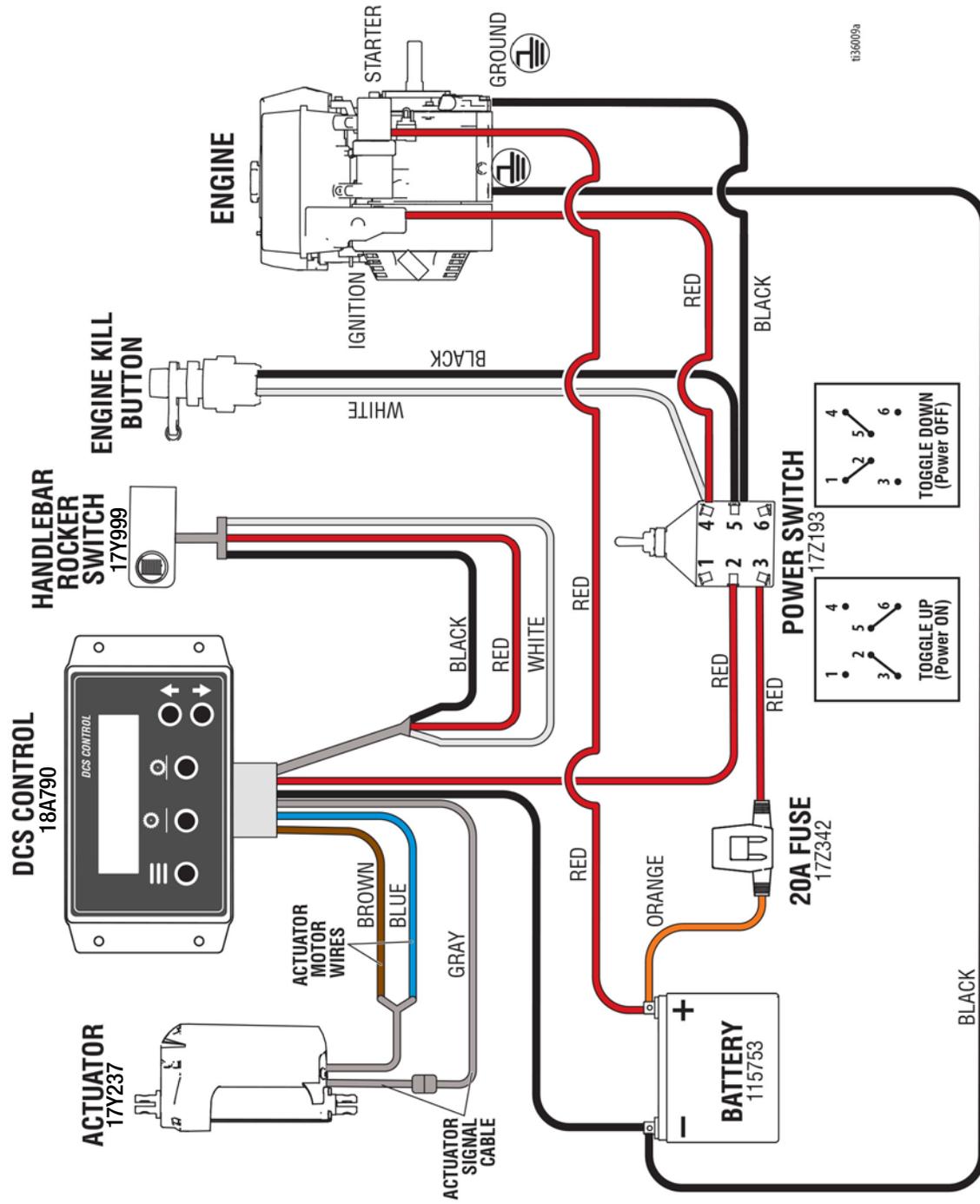
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Parts List

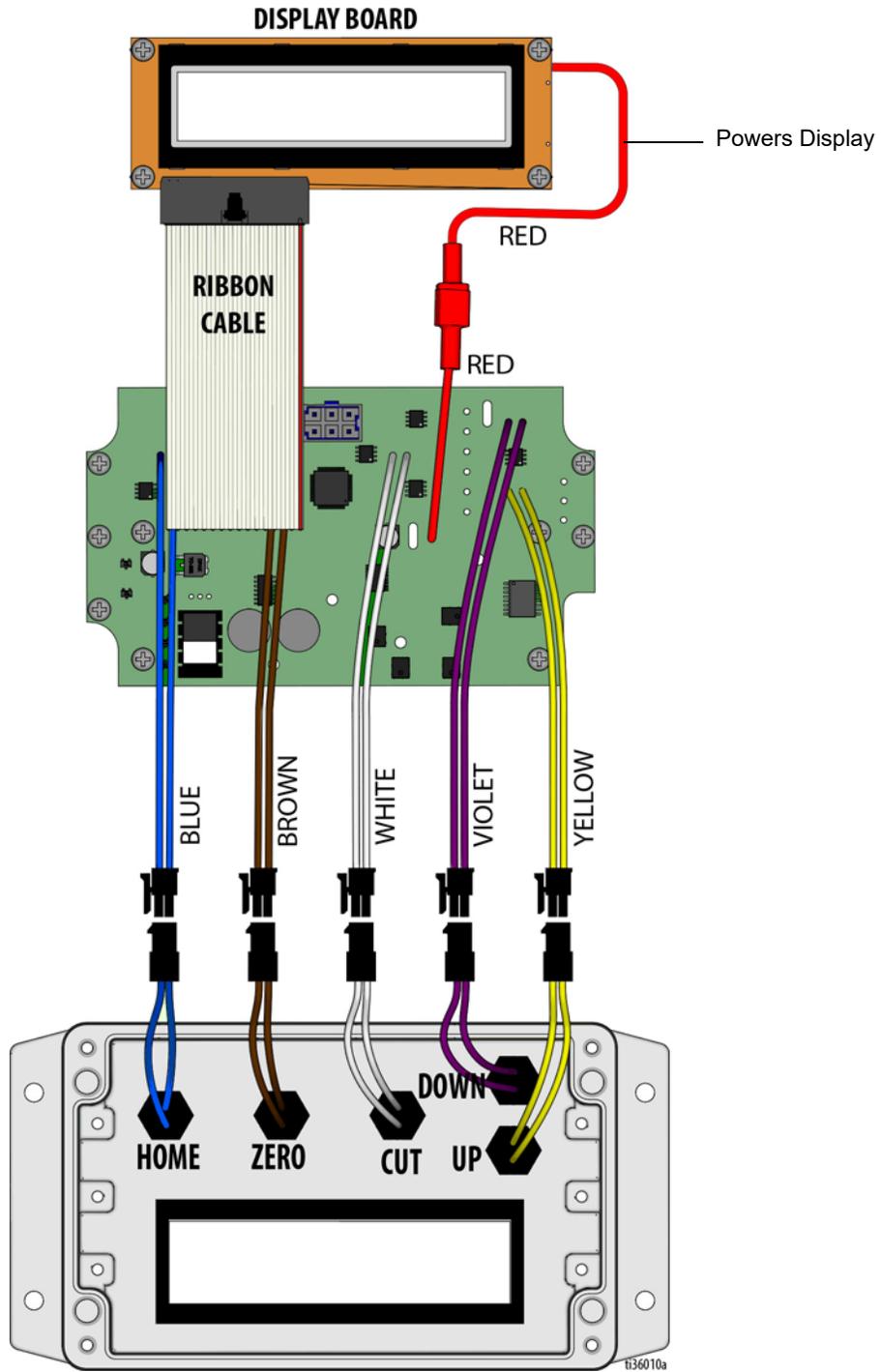
Ref.	Part	Description	Qty.
300	18A690	KIT, DCS Control Box, machined <i>includes 300a - 300f</i>	1
301	17Y686	LABEL, control, SMITH DCS	1
302	18A691	KIT, potted DCS Control PCB	1
303	18A692	KIT, display board, DCS control	1
304	18A693	KIT, home button, DCS	1
305	18A694	KIT, zero button, DCS	1
306	18A695	KIT, cut button, DCS	1
307	18A696	KIT, up button, DCS	1
308	18A697	KIT, down button, DCS	1

Wiring Diagram

DCS System



DCS Control Box



Technical Data

SMITH FS200		
Noise level (dBa)		
Sound power	107 dBa per ISO 3744	
Sound pressure	92 dBa measured at 3.1 feet (1m)	
Vibration level*		
Right/Left Hand	11.4 m/sec ²	
* Vibration measured per ISO 5349 based on 8 hr daily exposure		
Dimensions/Weight (unpackaged)	US	Metric
Height	40 in.	102 cm
Length	42 in.	107 cm
Width	15 in.	38 cm
Weight	125 lb	57 kg

SMITH FS209		
Noise level (dBa)		
Sound power	107 dBa per ISO 3744	
Sound pressure	92 dBa measured at 3.1 feet (1m)	
Vibration level*		
Right/Left Hand	9.5 m/sec ²	
* Vibration measured per ISO 5349 based on 8 hr daily exposure		
Dimensions/Weight (unpackaged)	US	Metric
Height	40 in.	102 cm
Length	42 in.	107 cm
Width	16 in.	41 cm
Weight	150 lb	68 kg

SMITH SPS10		
Noise level (dBa)		
Sound power	109 dBa per ISO 3744	
Sound pressure	94 dBa measured at 3.1 feet (1m)	
Vibration level*		
Right/Left Hand	13.5 m/sec ²	
* Vibration measured per ISO 5349 based on 8 hr daily exposure		
Dimensions/Weight (unpackaged)	US	Metric
Height (handle up)	53 in.	135 cm
Height (handle down)	42 in.	107 cm
Length	38 in.	97 cm
Width	20 in.	51 cm
Weight	250 lb	114 kg

SMITH SPS10 DCS		
Noise level (dBa)		
Sound power	109 dBa per ISO 3744	
Sound pressure	94 dBa measured at 3.1 feet (1m)	
Vibration level*		
Right/Left Hand	13.5 m/sec ²	
* Vibration measured per ISO 5349 based on 8 hr daily exposure		
Dimensions/Weight (unpackaged)	US	Metric
Height (handle up)	53 in.	135 cm
Height (handle down)	42 in.	107 cm
Length	38 in.	97 cm
Width	20 in.	51 cm
Weight	263 lb	119 kg

CALIFORNIA PROPOSITION 65



WARNING: This product can expose you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

All written and visual data contained in this document reflects the latest product information available at the time of publication. SMITH reserves the right to make changes at any time without notice.

Original instructions. This manual contains English. MM 3A5578

SMITH Surface-Prep Solutions
2504 NW 19 Street
Pompano Beach, FL 33069
www.SMITHmfg.com
 Revision A, September 2020

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This warranty does not cover, and SMITH shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-SMITH component parts. Nor shall SMITH be liable for malfunction, damage or wear caused by the incompatibility of SMITH equipment with structures, accessories, equipment or materials not supplied by SMITH, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by SMITH.

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